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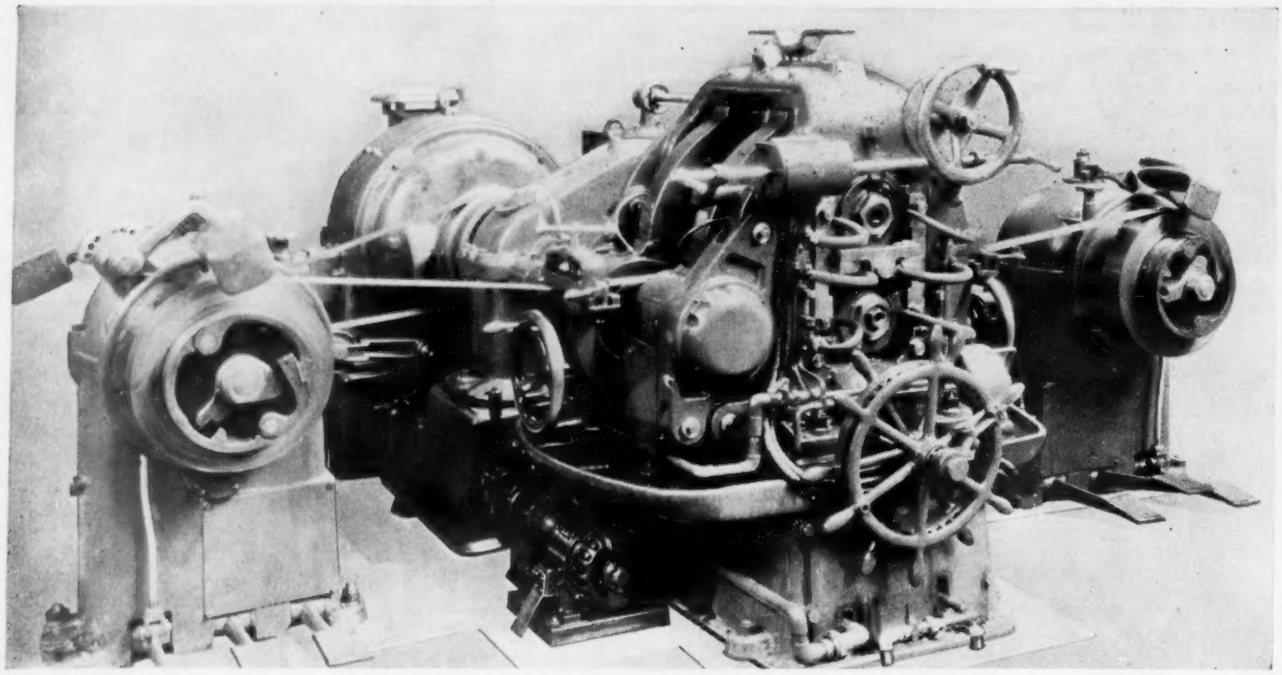

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The Week in Perspective

WHILE one cannot be certain of anything, the events of a hectic week of maneuvering on the labor front seem to indicate that the threatened strike in the steel industry will be averted. Beginning last Monday and continuing through the week, abundant evidence was available to show that a great majority of the nearly 400,000 employes prefer work to a walkout. This conclusion is borne out by independent newspaper polls, by the testimony of an employes' delegation to Washington, by employes' ballots in numerous plants, and by interviews (p. 14) by associate editors of STEEL with typical mill workers in plants in the Pittsburgh and Mahoning valley districts.

With Notable Exceptions, Newspapers Give Industry a "Poor Break" on Labor News

Notwithstanding the fact that those desiring to strike are in a decided minority, the statements of the spokesmen for the rank and file element of the Amalgamated association have been given more publicity in many newspapers than the more restrained comments of Michael Tighe and other seasoned leaders. If you are curious regarding the apparent pro-union bias of a portion of the daily press, consider the action on Thursday at St. Paul of the American Newspaper Guild in adopting a resolution "outlawing company unions." But before blaming it entirely upon the reporters, try to explain why the editorials of many newspapers are unfavorable to employers, whereas the column writers in the same sheets usually are fair in their treatment of labor relations.

Mr. Green, Lambasting Employers for "Autocratic Attitude," Belatedly Supports New Wagner Bill

As this is written, the fate of the revised Wagner bill still is uncertain. After remaining silent for days, William Green on Thursday finally committed the A. F. of L. to its support, and at the same time criticized the "steel barons" (How the headline writers like that word!) for their "autocratic attitude" and blasted congress for its failure to pass the original Wagner "disputes" bill. Speaking of "autocratic attitudes," the first Wagner document was so autocratic in its provisions that, had it been enacted into law in accordance with Mr. Green's wishes, it would have prohibited—in spirit if not in letter—the issuing by United States Steel Corp. subsidiary companies of the fair-minded, well considered statement to employes which went out last week over the signatures of the subsidiary company presidents.

A New Conundrum for Code Members: What Does New Price Control Policy Mean?

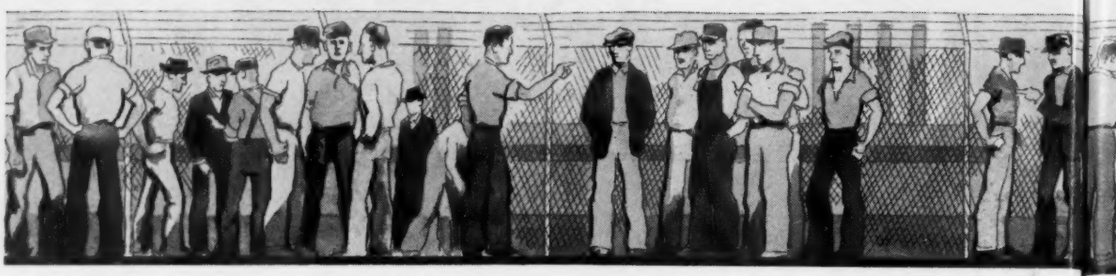
When NRA on Thursday announced modifications in its price control machinery, it unloosed a bomb whose reverberations may extend even beyond those set up by the famous Section 7a. Ink on the new order was barely dry before reports of widespread price-cutting in certain industries began to filter in to NRA headquarters. Steel company executives, however, were confident (p. 19) the changed policy will not affect the steel code. To code members in all industries, the best advice is to sit tight and wait clarification of the new ruling. The ultimate effect will depend largely upon administration and interpretation—just as has been the case with the collective bargaining clause . . . . In spite of all the shouting, business generally (p. 27) and steel demand (p. 63) are on a higher plane than sentiment. Even the farmers (p. 31) are buying more freely.

Science Marches On—Steel Plate Floor Is Tested—What of Future Plant Expansion?

Early in the week the world again was reminded of the inexorable advance of science when dispatches from Rome announced the discovery of Element "No. 93," created from uranium (p. 60), and having properties analogous to those of manganese. In Washington the national bureau of standards has conducted a load test on a "battledeck" floor (p. 38), with results which confirm the American Institute of Steel Construction's allowable load tables. Also of interest to structural steel fabricators is the appearance (p. 61) of the 24th edition of the "Carnegie Pocket Companion." . . . . From Cleveland comes the opinion of a machine tool builder (p. 46) that the increased efficiency afforded by recently improved cutting tools will revolutionize future plant expansion.

—*Bachrach Photo*

John D. Knox



STEEL LABOR APATHETIC TO UNION, PREFERS WORK TO STRIKE

THE impending steel strike—how does the man in the mills feel about it? What are his loyalties and antagonisms? Is he resentful against his employers, thus making him an easy prey for union organizers; has he been won over by employe representation plans; or does he merely want to be left alone, with an opportunity to work and clean up his debts? Just what is his temper, anyway?

To learn the answers, STEEL last week sent two associate editors into the mills—John D. Knox in the Mahoning and Shenango valleys and Edward A. France Jr. in the Pittsburgh district. In the very heart of the steel industry, in the Ruhr of America, they talked not with executives or superintendents or foremen but with the men themselves. As nearly as is humanly possible they gaged the actual sentiment of labor. Every incident related is true.

Even if the "holiday" called by the Amalgamated Association of Iron, Steel and Tin Workers for next Saturday is averted, it is highly probable that by some form of election Washington will undertake to ascertain just whom the men in the mills want to represent them.

In the Valleys:

By John D. Knox

I TOOK a trip through the valleys one day last week and I talked with many of the men there actively engaged in making steel—not executives but men with sweaty shirts, first and second helpers and slaggers on open-hearth furnaces, men in the pipe mills, cranemen, men in strip mills, colored men, foreign-born and native Americans.

And based on conversation with these men, sentiment in this district does not point toward labor trouble. At least 90 per cent of the men are not interested in the strike slated for this month. They are perfectly satisfied. They want to be left alone. They want to work.

The men with whom I talked were not aware that their answers to my questions would appear in print nor did they entertain for one minute any such thought that perchance I might be seeking information for some executive in their company.

We talked shop—how many heats are you getting off your open-hearth roof? Are you having any trouble holding the strip to gage? and interspersed frequently were questions bearing on the strike situation.

I asked a craneman at one plant if he thought there would be a steel strike.

"They say so in the newspapers," he said, "but as far as I am concerned there will be no strike. I want to work; in fact, I have to plug along every day with a wife and kiddies at home waiting for the old pay check."

"But," said I, "suppose a strike is declared and you are challenged by pickets stationed at the time office gate?"

"Ah," said he, "That's where I'll fool them. If a strike is called while I am working the day trick, I'm not leavin' the plant. If the company can keep a few cans of beans and a can opener handy, I'll be ready to raise the big hook on the crane the next morning when the hitch is made.

"I don't intend to take another man's job. No, sir, not me. But I'm sure no dude with a red feather in his hat at the mill gate shoutin' his wares like a sideshow barker is goin' to convert me to thinkin' my job isn't o.k. No, sir, not me."

And as I wended my way past the hot bed and glanced over my shoulder, I saw the little craneman mount the stairs leading to his cab, taking two steps at a time. And I couldn't help remarking: "That fellow surely is sold on his job."

Next, I talked with an American over in one of the tube mills, and after asking a number of foolish questions having nothing to do with the strike situation, in order to throw him off his guard, I said, "I suppose one of these days you'll be going out on a strike?"

Here is what he told me in reply:

"My boy, I don't think there's going to be a strike. There is a little talk here and there, but it doesn't amount to a bobbee. Even though it did, I wouldn't be interested. I was in the strike back in 1909. The union organizers promised me many things—more money, better working conditions and every-

E. A. France Jr.

thing else except the moon. And I took my dinner bucket and walked out.

"I was out a year and I saw my bank account wiped out. I had a hard time keeping my family in the common things of life. I lost my home. And not one of the promises made by the organizers ever was kept. I made up my mind then and there that if I ever got another job, they'd never get me out on another loafing spell and they never have. As long as the company keeps the orders coming, I'll be grabbing the skelp with this pair of tongs," he chuckled, holding up the familiar-shaped tongs used at buttweld pipe mills, "and seeing that the old drawbench chain pulls her and the skelp through the bell."

Hot, But a Job's a Job

Later in the day, while driving over one of the bridges in Youngstown leading up to the south side, I noticed workmen going in and out of a plant; shifts were being changed. And so I took up my station on the sidewalk overlooking several of the mill buildings, hoping to walk a little ways with a workman who perchance might be off duty. Soon I fell in step with a Polish fellow. His shirt was wet with perspiration and as he wiped his brow, I engaged in conversation with him, thus:

"Pretty hot in the mill today, Mike?" I inquired.

"Yea, mister, plenty. I drinka lots of water, but she no stop a heat," said he. "We no get a rain pretty soon," he continued, "we no eat."

What a break for me! Just the opening for which I was looking and I can assure you I didn't lose any time pressing the questions. Said I:—

"Well, if there is a strike, Mike, food will be rather scarce, too, won't it?"

"Strike, you say, mister? No goin' be strike. Men no crazy. Say, mister, wait a minute. You see sparks spittin' out of bessemer? Look, you see?"

"Sure. You mean over there," said I, coming to a halt and pointing to sparks being emitted from the mouth of a bessemer converter at the far end of the plant.

"Yea," said he with an emphatic tone. Wiping his brow again, he continued with plenty of emphasis:

"Two vessels now she be working, night time too, mister. See steam she be coming out that pipe over there," he asked, pointing to a stack from which steam was being ejected intermittently.

"Yes," said I, transferring my gaze from the bessemer flame to the exhaust pipe protruding from the building almost beneath where we were standing.

"Steam she come from blowing mill engine. She puff long time now. Listen," he said, holding up his dirt covered hand, "you hear boom?"

I assured him I did, for while the heated ingots could not be seen entering and leaving the blooming mill, the metallic ring of the rolls could be heard above the noise of the traffic, as the steel entered the passes.

"That noise she come from the bloomer," he continued. "Bloomer she knock out tonnage. Whistle she blow for ingot lots of time now. For long time she no do that. You think I strike you talk about? Oh, no, mister, not me. Gotta lots money now, lots of meat. No have to stand at gate now for job like winter time. No sir, mister, me work now."

Steel executives refusing to treat with him, "reds" in his organization demanding radical and prompt action—it's no easy post these days for Michael F. Tighe, president of the Amalgamated Association of Iron, Steel and Tin Workers. Wide World photo

And with a "So long" he was on his way. As I watched my Polish friend turn the corner, I gave my brow a mop with my handkerchief, climbed back in my coupe, stepped on the starter and was off for another plant in the Mahoning valley, at the same time wondering whether my new acquaintance "Mike," as I called him, thought I was an organizer.

If he did, I was unable to discern it from his countenance. All through the conversation he was busy gesticulating with his hands as a means of emphasizing that he was satisfied with the present setup. And I believe he was sincere.

Charging Time on No. 7

In another part of the valley I entered a plant enclosure, crossed the railroad tracks, mounted the stairways leading to the gas producer house and from thence I came out on the charging floor of the open-hearth shop.

The crew on No. 7 furnace was patching the bottom and I drew closer to marvel at the skill of these men in directing shovelfuls of magnesite into holes in the hearth caused by the heat tapped out but a few minutes before my arrival. The job finished, the door was closed and the men took off their blue glasses and put them in their shirt pockets.

The moment one of the men removed the blue glasses from his nose I recognized him as a former second helper on one of the open hearths in the Buffalo district. So over to the bench where he had seated himself I went and plunked myself down by his side. A little locomotive brought a drag of charging boxes filled with scrap to No. 7 and while the charging machine emptied the scrap onto the hearth my friend and I renewed our acquaintanceship.

In the course of our conversation I asked him for his unbiased opinion regarding the possibility of a steel

strike this month. Without any hesitation whatsoever, he told me this:

"The company took a poll recently in the plant to ascertain how many of our men were in favor of a strike, and I understand from 90 to 93 per cent of the boys are not going out. In fact, no one is talking strike around here. Throughout the depression we've had at least three days' work a week and while many of us on the floor have had to go from second helping to slagging, yet we had jobs and some pay coming every two weeks. And that's better than we'd be getting if we'd listen to some of the agitators who by the way should be given a red ticket good for a one-way passage to Russia."

And as he finished, I inquired if he had been approached by any union organizers. He replied in the negative. Then I asked him if he knew of any dissatisfaction within the ranks of the men in his plant to which he answered:

"Yes, over in the chipping department, there frequently come rumblings of dissatisfaction," he said, "but then those fellows kick every once in a while."

"I'll tell you," said he, "if a strike is declared and there is a partial walkout, I expect to live here in the plant. I've told my wife if she hears of a strike having been called and I'm not home after two hours or so beyond the time I usually arrive—I've told her to pack a suit case, take the kids and go and visit her folks.

"Of course, if a majority of the men go out, I'll have to go with them. But if the walkout is of a scattered character in the plant, we'll be puttin' heat to the furnaces just the same—that is, if the boss arranges to have a bed and a little hash now and then. Personally, I think the whole thing will be a flop."

I talked with many more men in the various plants which I visited and the answers to the questions I propounded regarding the possibility of strike essentially were the same or nearly the same as those already enumerated. Certainly the utterances I heard would not lead you to believe that a strike of any serious consequence is pending.

On the horizon there may be storm clouds, but the general consensus of opinion of those whose hands are making and touching steel or the raw materials employed, is that the clouds are scattered and that there is little likelihood of their becoming joined to fog the issue. One man said, "Just what 7 to 10 per cent of the men classed as uncertain may do in the way of intimidation, is difficult to determine." But meanwhile, the water in steel mill yards from one end of the Mahoning valley to the other is not even muddy.

At Pittsburgh:

By Edward A. France Jr.

I HAVE just made a first-hand survey of the labor situation in the Pittsburgh district, which probably represents a cross-section of American steel labor.

On a suburban train coming into Pittsburgh I met Thomas W—— after he got on at the station of a tin plate mill about 30 miles out, and we fell into conversation. A Welshman, he had come to this country early in life and had worked for the same mill 27 years. He had started as a roller in the hot mills, and was still a roller. Naturally, talk soon drifted to the steel strike.

W—— said he never had and still hasn't any time for the outside labor organizer. He had made good money when work was steady and now, once again, with tin mills running full or close to it so that he had five turns work a week, he was making a good income per month. (In this particular job, with 40 hours weekly, a roller will make about $200 monthly).

I asked him how the employe representation plan was working in his department but his reply evidenced little interest. Apparently, while he had voted for representatives at the elections, he had little actual need in his 27 years for making any demands on the management.

He passed this subject off with the assurance that his boss, the foreman, was a good friend of his and that he took all his troubles—which were few—to him. He always got satisfaction; he supposed complaints were settled through the workings of employe representation councils.

There were not, or hadn't been, any serious complaints from other rollers in W——'s department. A friendly and democratic tie bound management to the men at this works, from little incidents W—— had time to tell me.

Within the past month, though, W—— said strangers had been standing outside of the mill entrance and hanging around a beer garden across the street. They had come up to him and others. W—— had been suspicious of them first off and had told them he wasn't interested in going to a beer party that particular night "to get acquainted."

Rebuffed by most of the men, these organizers had let things drop, but early last week W—— and others were approached by several men they had never seen before.

They had told him simply "that they were friends of his and that they wanted to give him a tip." They had "heard that someone might get into his home when W—— was on his 11 p.m. to 7 a.m. shift and might cause a little trouble with his wife and children." Beyond that, W—— could get nothing. His informers moved along. The same night before going to work he told his mill boss about the incident and in turn was promised protection for his home.

I left W—— at the Pittsburgh station. He was on a vacation in Pittsburgh for the day until he would return that evening for the 11 p.m. shift. Making good wages, satisfied with his lot and genuinely antagonistic toward anyone jeopardizing his job, W——, I felt sure, would no more welcome a steel strike than dismissal.

I KNOW of Joe K—— indirectly, yet close enough to know all of the salient facts of his case and with enough background to know Joe's reactions to today's problems.

Joe is a rod man in one of the wire mills outside of Pittsburgh. He works on a 12-inch Garret rod mill. Rather, he works when he has work, for in all of 1933 he had steady work only 36 full days.

Working for the Love of It

The rest of the time was split up among part-time days, with much idle time through no fault of Joe's or the company that he worked for. Orders, except for a few summer months last year, weren't enough to keep the 12-inch mill going.

Joe's middle name is industry—he likes to work and keenly feels deprived when the mill does not call him by telephone for duty on a coming shift. For the past month and a half, though, Joe has averaged better than four days work a week, better than any month and a half for three or four years. The past two weeks he has been on five full days and, of course, is exceedingly happy. Of a conscientious nature, he has debts he wants to pay off. Most of these were contracted during 1932 and 1933 and aggregate over $1000. Only steady work will whittle the total down.

Like everyone else in the rod mill, Joe was invited to a "get-together" last March by a representative of the Amalgamated Association of Iron, Steel and Tin Workers. It was held in a small hall in the mill town, and there were others there, and Joe went.

Later, more get-togethers were held, and some of Joe's friends in the mill ultimately took out paid-up union cards. Eventually a local chapter of the union was formed, but of the total number in the mill some-

(*Please turn to Page 82*)

Mediation Board of 3 May Quell Threat of Steel Strike

WASHINGTON, Friday night: A MEDIATION board of three men was believed here tonight to be the solution of the strike threatened in the iron and steel industry.

Following two days of negotiations in New York and Washington, meeting separately with representatives of producers and the union, government officials stated tonight that they have formulated a plan which, apparently is acceptable to both sides.

Edward F. McGrady, assistant secretary of labor and former star labor lobbyist in congress, said steel executives at a final conference had agreed to a mediation board of three. On leaving this conference the steel executives, in evident good humor, declared it would be out of place for them to comment.

May Need Referendum

The labor committee of five of the Amalgamated Association of Iron, Steel and Tin Workers left the conference to report back to a committee of 23, known as the rank and file committee, and in turn report back to General Johnson Saturday afternoon. There was a possibility that a referendum, requiring several days, would be required.

All through the negotiations the government has stood rather firmly for a board. This was the President's solution of the threatened automobile strike March 25, there being one representative each for producers, labor and the government. In the case of the automobile industry the plan may have averted a strike but labor has never accepted wholeheartedly the proportional representation idea which is its base. Organized labor is for representation of majorities only.

Peace overtures started Thursday when General Johnson met in New York with a committee of the American Iron and Steel institute. In positive terms, of the character the general employs, he was informed that the industry would not recognize the Amalgamated. The industry took the stand that demands of the Amalgamated related not to grievances but to the closed shop, for which the industry would not stand. First proposals of a mediation board also were rejected.

The scene was transferred to Washington Friday, so far as the industry was concerned. A committee composed of W. A. Irvin, president of the United States Steel Corp.; E. G. Grace, president of the Bethlehem Steel Corp., and L. E. Block, chairman of the Inland Steel Co., carried the load. Other executives were at the Mayflower hotel and in contact with the committee.

Much of the week, the radical element of the Amalgamated association was in Washington, loudly demanding an audience with the President—which was not granted; berating Secretary of Labor Perkins, and threatening action even before the tentative strike date of June 16.

One of the early steps of Secretary Perkins and General Johnson was to co-ordinate the labor faction. Eventually the Amalgamated representation was lodged in five men: Michael F. Tighe, president; Edward W. Miller, vice president; and William J. Long, Clarence Irwin and Earl J. Forbeck. Messrs. Tighe and Miller are rated as conservatives; the other three are radicals.

Chronologically, Friday developments were the closing of the ranks in labor followed by separate meetings of government officials with the steel committee and the labor committee separately.

At no time did steel executives join with labor leaders, thereby avoiding any possibility that recognition might be claimed. Mr. Tighe, however, shook hands with steel executives on leaving General Johnson's office.

For the government, Secretary Perkins, General Johnson, Mr. McGrady and Senator Wagner, author of the Wagner labor bill which in its original form outlawed company unions and in its revised form is still under fire, were the chief factors.

President Little in Picture

The President's role in the steel strike negotiation has been inconspicuous, contrasted with his prominence in the automobile situation. The expectation that he would personally intervene had not materialized up to Friday night, although there was the possibility that the peace plan might be announced at the White House.

Except for a conference with Secretary Perkins and for the radical Amalgamated leaders camping on his doorstep, the President today at-

Smoke like this means work for labor and profits for stockholders. Whether it continues depends largely upon negotiations now being conducted in New York and Washington. This scene of activity, snapped by Wide World photos, is at the Otis Steel Co. Riverside works in Cleveland

tended to other matters of state. Nothing was given out at the White House concerning the charge of the Amalgamated that 116 men were discharged at the Weirton Steel Co. plant for union activities.

It was reported in Washington Friday, incidentally, that several steel companies now in bad financial condition will shortly file application for reorganization under the new bankruptcy law.

A board of mediation ordinarily has no compulsory powers. It is merely a third party to which disputants turn for reconciliation. A board of arbitration is one to which disputants present their differences, and its powers are final.

Send Summons for Tighe

Negotiations between Mr. Tighe and a committee of the Amalgamated with the Western Bar Iron association, under way in Cleveland to determine a new scale, were postponed Thursday when Washington sent for Mr. Tighe. This was after the radical element of the Amalgamated had declared to Washington officials that "Mike Tighe represents no one but himself and his henchmen and perhaps the United States Steel Corp." No progress was made Friday until the conservative and radical groups were brought together.

While Washington was trying feverishly last week to avert the threatened steel strike, evidence was accumulating in practically all important steel-producing districts that employes generally are opposed to the proposed union "holiday."

At the Weirton, W. Va., and Steubenville, O., works of the Weirton Steel Co., 9801 workers definitely voted last week against the strike and only 460 employes, or less than 5 per cent, favored it. A similar vote is being taken at the Clarksburg, W. Va., works of the company.

Will Defy Amalgamated

A statement by 44 employe representatives of the Weirton company says: "We know there is no sentiment in favor of a strike. We expect the mills to continue to operate in spite of any call that might be issued by the Amalgamated, and we intend to do everything in our power to protect the large majority of employes whom we represent and who desire to work."

At Cleveland, the entire committee of the employe representation plan of the Cuyahoga works of the American Steel & Wire Co., representing 3000 employes, dispatched letters to Senator Wagner declaring that employes are satisfied with their representation plan, they resent being called "scabs" because their choice is not with organized labor. To Senator Wagner they said:

"Please lay off. We don't intend being put on the spot. It's little enough to ask—to lay off—to let us work out our economic destiny in our own manner. If time proves that our choice was unwise we'll admit it. After all, we take the risks."

At this time, elections for employe representation are being held in many steel plants. Carnegie Steel Co. and Jones & Laughlin Steel Corp. employes in the Pittsburgh district nominate June 11 and elect June 15. Wheeling Steel Corp. employes elected June 6, results at its Steubenville works showing 3908 out of 4077 eligible voters cast ballots in favor of employe representatives.

Youngstown Sheet & Tube Co. employes on June 7 and 8 held their 17th election, about 20,000 at Youngstown and Indiana Harbor being eligible. Republic Steel Corp., now with 37,000 men on its payrolls, on June 15 holds elections in all plants. The election by Sharon Steel Hoop Co. employes is slated for June 17. American Sheet & Tin Plate Co. elections have been proceeding the past week, with indications that 87 per cent of employes favor the representation plan.

Employes at the Middletown, O., and Ashland, Ky., works of the American Rolling Mill Co. have taken no action regarding a strike and leaders of the employe representation plan say they are not interested. The 2100 employes of the Butler, Pa., works of the company at a mass meeting adopted a resolution opposing a strike and extending a vote of appreciation to the company for maintaining plant and wage standards.

Mills Being Safeguarded

Both union forces and steel producers last week were preparing for eventualities. The sheriff of Allegheny county (Pittsburgh) has sworn in 40 extra deputies, all of them reported to be ex-service men. Many plants have protected their properties with barbed wire, have installed flood lights and laid in supplies of tear bombs. Some also have stored cots and food in case employes are beleaguered. So far as known, however, the charge of Governor Pinchot of Pennsylvania that machine guns have been purchased by mills is groundless.

From the standpoint of the union, the "moving gang" idea may prove an effective weapon, one that producers find difficult to combat. In the captive coal mine and the Ambridge difficulties last fall the unions mobilized gangs of men, on trucks, which struck suddenly at various plants and mines. These raiding parties usually attack the weakest spots and terrorize loyal employes.

There have been numerous cases of employes taking it upon themselves to remonstrate against a strike. For instance, a delegation of workers at the National Tube, American Sheet and McKeesport Tin Plate companies at McKeesport, Pa., went to Washington last week to ask that the government insure them protection. Strong a union city as Duquesne, Pa., is, its mayor last week issued a manifesto saying that citizens and tradespeople condemn the strike and protest against the influence of outside agitators.

Records

TIMKEN STEEL & TUBE CO., Canton, O., in May poured 14,828 tons of steel in its electric furnace department, exceeding the former record of the Timken company by 1636 tons and believed to be a world record for electric furnace alloy steel production. Electric furnace production at the Timken plant in the first five months of 1934 has totaled 63,267 tons, compared with 24,200 tons in the same period of 1933.

New Capacity

A PITTSBURGH interest is reported to have booked the mill equipment for the strip mill which the Youngstown Sheet & Tube Co., Youngstown, O., contemplates erecting at Struthers, O., but confirmation is lacking. Sheet & Tube recently took bids on 5000 tons of shapes for the mill building.

NRA

A BASIC hourly wage rate of 40 cents is provided for iron ore miners in the lake Superior district in the general code passed upon last week by a committee representing the Lake Superior Iron Ore association, Cleveland. The lake producers now are paying 44 cents, having granted a 10 per cent increase in April. The code follows the revised steel code in providing a maximum of 8 hours employment per day. The NRA desires that the code include ore mining in all districts of the country, and following approval of the new draft by lake producers further conferences will be held at Washington.

Production

STEEL production rebounded 2 points last week to 62 per cent, equal to the high point reached in the second week of May. Strong gains were registered in all the major districts and in a few of the minor. Details for the various districts follow:

Youngstown—Advanced 3 points to 66 per cent last week, and the rate is expected to hold at this level this week.

Cleveland - Lorain — Declined 1 point to 78 per cent last week. National Tube Co., Lorain, O., continued with all of its 12 open

hearths; Corrigan-McKinney Steel Co. with 13, while Otis Steel Co. dropped first to 6, then to 5 units. Little change from this schedule is anticipated this week.

Central eastern seaboard—Gained 1 point last week to 46½ per cent, with indications that the top of the present upward movement has been about reached. Finishing operations are showing a proportionally greater increase.

Wheeling—Up 5 points last week to 79 per cent, with 30 out of 39 open-hearth furnaces in the four district plants active.

Detroit — Continued at 100 per cent last week for the fifth consecutive week, all 17 open hearths operating.

Pittsburgh—Advanced 4 points to 54 per cent last week due to an advance in schedules by a leading independent. This rate is expected to hold through this week, and possibly will be bettered next week, although uncertainties exist because of impending labor difficulties.

Twenty-six out of 60 blast furnaces continued in blast last week, making this rate 44 per cent. Individual rates among blast furnace operators are as follows: Carnegie Steel Co., 10 of 32; American Steel & Wire Co., 1 of 2 at Donora, Pa.; National Tube Co., 2 of 4 at McKeesport, Pa.; Bethlehem Steel Co., 5 of 7 at Johnstown, Pa.; Jones & Laughlin Steel Corp., 6 of 11 between Aliquippa, Pa., and Pittsburgh; Pittsburgh Crucible Steel Co., 1 of 2 at Midland, Pa.; and Pittsburgh Steel Co., 1 of 2 at Monessen, Pa.

Buffalo—Increased 2 points to 55 per cent last week and the rate will be unchanged this week. Twenty-one out of 38 open hearths are in operation and there is a possibility of additional capacity being brought into play this week if labor troubles are averted in the metal trades. Present signs point to curtailment of operations about July 1, works executives believe.

Birmingham — Unchanged at 55 per cent, with indications pointing to a decline of about 20 points as rail orders come to an end.

New England—Dropped sharply and unexpectedly last week to 70 per cent, a loss of 14 points. One works planned capacity operations for inventory for a brief period, but the schedule did not materialize. Another plant is at 90 per cent. Indications for this week point to little change, possibly with the loss of a few points.

Chicago—Advanced to a new peak for the year at 70 per cent, up 5 points from the previous week. Little change is in prospect for the coming week. Fourteen of the district's 36 steelworks blast furnaces now are active.

Steel Code

STEEL executives in New York Friday were confident that the new NRA policy concerning prices will not eliminate the ten day waiting period of the steel code. The view of the industry is that the steel code is a contract, approved by the President, and that it cannot be changed in any detail by Washington so long as it exists and this is until the expiration of NIRA next June.

Discontinuance of the code is possible, of course, but since the steel code is the very heart of NRA no such action is believed probable. The steel code authority of course has the power to make amendments suggested by the President. The present view is entirely that no change is probable.

Contests

AMERICAN Institute of Steel Construction, New York, has selected the three following bridges as the most beautiful built of steel in their price class last year, and later this summer will decorate them with stainless steel plaques:

Cedar street bridge, Peoria, Ill., in the class of $1,000,000 and over. It was fabricated and erected by the McClintic-Marshall Corp., Bethlehem, Pa., for the city of Peoria. Honorable mention in this class was given to the South Tenth street bridge over the Monongahela river at Pittsburgh.

Shark river bridge, fabricated and erected by the American Bridge Co., Pittsburgh, for the class of $250,000 to $1,000,000. Honorable mention in this class went to the Shrewsbury river bridge at Seabright, N. J., also erected by the American Bridge Co. for New Jersey.

In the small bridge class the "Dr. John D. McLoughlin bridge" over the Clackamas river at Portland, Oreg., was the choice, this bridge being fabricated and erected by Poole & McGonigle, Portland, for the Oregon highway commission. The Port Clinton bridge over the Portage river at Port Clinton, O., won honorable mention.

Copies of Revised Steel Code Are Available

IMPORTANT changes in the steel code, which become effective June 11, were summarized on page 12 of the June 4 issue of STEEL. Interpretation of the new provisions, as may develop from time to time, will be presented fully in forthcoming issues.

For those desiring the exact wording of the text the Penton Publishing Co., publisher of STEEL, has prepared a reprint of the complete code as amended May 30 and effective June 11. A new table of basing points also is provided.

The booklet is of convenient pocket size with paper cover and the text is printed in large, legible type. Single copies can be furnished for 25 cents, or quotations on larger lots can be obtained upon application to the Penton Publishing Co., 1213 West Third street, Cleveland.

Transportation

REVISION of the fabricated-in-transit privilege on iron and steel freight rates is docketed for a hearing before the Central Freight association at Chicago, probably the week of June 25.

Among associations participating in the hearing will be the Independent Steel Fabricators' Traffic association, Pittsburgh, of which H. N. Holdren, Pittsburgh-Des Moines Steel Co. is chairman; Reinforcing Iron and Steel institute, Youngstown, O., of which E. J. Eldredge is chairman; and the Central Freight association. The American Institute of Steel Construction also is likely to be represented.

Among revisions in the F.I.T privilege which are to be reviewed are a proposed increase in transit charges from 3 to 6½ cents, inclusion of sheets in F.I.T. steel tariffs, inclusion of pipe fabricated from steel plates, and a review of the contentions some carriers have had for eliminating bolts and nuts as well as wire rope from the F.I.T. privilege.

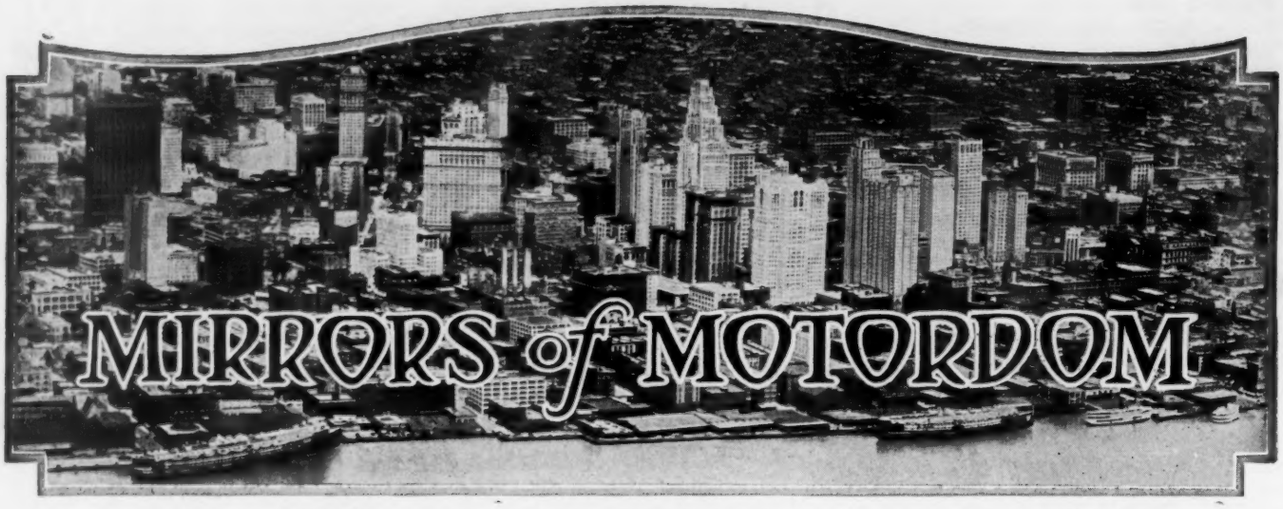
It is hoped that at the hearing, establishment of uniform fabricated-in-transit tariffs on iron and steel will be accomplished for eastern territory.

Merger

BETHLEHEM STEEL CORP., Bethlehem, Pa., is reported organizing a new subsidiary for the acquisition of the Williamsport Wire Rope Co., Williamsport, Pa., in receivership since September, 1932, and of which Bethlehem is one of four unsecured creditors. Bondholders are being offered $600 in Bethlehem 4½ per cent serial bonds and 3 shares of Bethlehem common stock for each $1000 Williamsport bond.

Steel To Go on the Air

American Iron and Steel institute, New York, will shortly inaugurate a weekly paid program on the National Broadcasting Co. network.



DETROIT

TO THE outsider it may look like a battle of the teacups. But, into the ranks of the automobile manufacturers themselves, last week's price cut by Chevrolet fell like a bombshell.

A signal gun that the 1934 car market is still to be free, wide and open, Chevrolet's slash precipitated the same move from Plymouth, Pontiac, Olds, Dodge and others. If Ford, up until ten days ago, thought he had the price edge for some time to come, the myth has since vanished. Close battle lines have been drawn even closer. It looks like a fight.

For almost two months now Ford has made hay on the slogan, "No change in price this year." Chevrolet and Plymouth thought, but were not conclusive, that their price upping was guessing the trend. But advances were the wisps that sadly bent the proverbial camel's back. Though price-cut recapitulations were hard pills to swallow, once down, the medicine should work wonders.

Just as Chevrolet's sales manager, W. E. Holler, pointed out last week, "The effect of the price reduction will naturally be the stimulation of retail sales. . . . Thousands of prospective buyers, we confidently believe, will take advantage of this opportunity. Soon the result will make itself felt over a very broad front."

Chester G. Abbott, Hudson Motor's sales manager, echoed these sentiments last week in proclaiming that Terraplane's lower-priced Challengers had been such a stimulant.

NO CORDON for Dillinger was more carefully laid than Ford's this spring for its arch rivals Chevrolet and Plymouth. Now that these latter two have slipped the noose, odds are shifting in Detroit again on whether or not this will be a Ford year. True enough, Ford himself can still fight fire with fire and name his own price cut.

If this were all to the battle, Detroit now would sit back and watch events transpire in the arena. But, now that prices are equal Chevrolet is launching a program of publicity that will back up its shock troops.

This General Motors subsidiary will soon billboard the country with posters simply showing a likeness of the Chevrolet six-cylinder motor. Beneath the picture will be these words only, "So good it does not need to be replaced." A more obvious left-handed slap at the Ford idea of factory reconditioning old V-8 motors, could hardly have been concocted by Chevrolet.

Knee-action wheels, according to a new $350,000 publicity fund for that purpose alone, are to be stressed in Chevrolet advertising beginning this month. Apparently, the idea set last December of building 800,000 Chevrolets by Aug. 1, 1934, may be ambitious but it has not been entirely abandoned.

Incidentally, leaf-spring progenitors are not counting themselves out yet. The coiled spring that motordom adopted so universally this year, looked like a knockout blow at first but the leaf-springers have come right back with a new idea.

That group of parts manufacturers has been developing a transverse leaf spring of an arm-parallelogram type with progressive pressed steel seats and claims a 50-pound saving in weight per car against coil springs. The new leaf type weighs 94 pounds to the coiled assembly's 144 pounds. Tests on a 3000-pound automobile show the new combination leaf and arm spring eliminate "bottoming" entirely and that oscillation periods run 70 to 80 cycles per minute in a normal position.

The progressive spring seats are designed to increase spring stiffness progressively with deflection.

Decreased costs, decreased weight and elimination of many service items are claimed for the new type of combination leaf spring. Possibly some of the 1935 cars will go to this new type of springing, but coiled springs and independent wheel suspension likely will lose none of their backers next year.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

1934	
January	161,086
February	235,384
March	336,016
April	360,620
Estimated by *Cram's Reports*	
May	350,000
Week ended	
May 26	76,281
June 2	54,185
June 9	69,107

ALTHOUGH passenger car and truck production rebounded last week from the Memorial day holiday, it did not recover all of the ground lost, and hence indicates a distinct downward trend.

In the week ended May 26, according to *Cram's Reports*, assemblies totaled 76,281; in the week ended June 2 they declined to 54,185 units and in the week ended June 9 they recovered to 69,107.

Buick at 2600 units for last week increased 560 over the previous week and indicated that it will fulfill its 11,000-car schedule for this month. Almost three-fourths of the current production is the small series "40". Incidentally, demand for the other Buick series has perked up since the small job was brought out.

Olds at 3000 a day was unchanged from the previous week, but in many cities Olds dealers still are far enough behind in deliveries on certain models to lose business to other makers. Pontiac last week assembled 1250 units, compared with 700 the week before and is not far behind the 6000-schedule set for June.

Ford snapped back rapidly last week in assembling 21,485 units, compared with 9985 in Memorial day week. Chevrolet went unchanged at 17,500 units, but Plymouth was down 1000 units to 8000, while Graham last week assembled 250 cars, com-

pared with only 150 the week before. A temporary suspension may be in store at Graham owing to fair-sized stocks of finished cars. It faces a decision whether to go through with the new die program or to repair and revise present tools.

Other rates of assemblies for the week ended June 9, with changes from the week ended June 2, are as follows: Auburn 200, up 40; Cadillac 372, up 150; Chrysler 1250, down 150; DeSoto 625, up 125; Dodge 3625, up 725; Hupp 214, down 14; Nash 1750, up 450; Reo 750, up 150; Studebaker 550, down 250; Hudson-Terraplane 2250, up 1250; Willys 750, an increase of 250.

REO, recently changing on a body source, has been assembling as high as 125 models daily at Lansing. A new 1½-ton truck by Reo will be out soon with streamlined fenders and revised design on some body panels. . . . Some of the steel that was stocked here last fall is even now finding its way into press rooms, but rejections have been high. In one case a run of fenders was tried with this old steel but rejections ran up to 19 per cent. . . . . Several dies for the new Packard, such as for the running boards and fenders, are being completed, but assemblies on this small car no doubt will be delayed until well after July. 1.

Blast Furnace Association Elects New Officers

C. P. Clingerman, superintendent, Carrie furnaces, Carnegie Steel Co., Rankin, Pa., was elected president of the Eastern States Blast Furnace and Coke Oven association at the annual meeting of the organization at the Pitt Field club, Pittsburgh, June 8. Mr. Clingerman, vice president of the association during the past year, succeeds B. M. Stubblefield, superintendent, Campbell works, Youngstown Sheet & Tube Co., Youngstown, O.

John C. Murray, assistant general superintendent in charge of the Northside division, Jones & Laughlin Steel Corp., Pittsburgh, was advanced from secretary-treasurer to vice president.

The new secretary-treasurer is S. T. Moran, superintendent of coke ovens, Republic Steel Corp., Warren, O.

Pig Iron Output Gain in May Is Decreased

Complete returns from blast furnaces in the United States show production of coke pig iron in May to be slightly lower than the compilation published in STEEL last week. The preliminary figures involved estimation by producers of output for the last two or three days of the month.

The actual average daily rate for May was 66,185 gross tons, which, compared with the 57,873-ton rate of April, was an increase of 8312 tons, or 14.4 per cent. The gain in April was 10.3 per cent.

Total production was 2,051,730 tons, a gain of 315,513 tons, or 18.2 per cent, over the 1,736,217 tons of April. Merchant iron amounted to 323,973 tons, and nonmerchant or steelworks iron to 1,727,757 tons.

For the five months ended in May, output has aggregated 7,909,970 tons, against 3,179,797 tons in the corresponding period of 1933.

Blast furnaces operating on May 31 totaled 116, one more than previously reported. The additional furnace made active in May was the Benson stack of the Ford Motor Co., Dearborn, Mich. On May 31, 1933, operating furnaces totaled 61.

Relating production to capacity, operations in May were at the rate of 48.0 per cent, against 42.0 per cent in April.

Officers Picked To Head Blast Furnace Group

George E. Rose, general superintendent, Wisconsin Steel Works, Chicago, was elected president of the Blast Furnace and Coke association of the Chicago district at a meeting held at the Gary Country club, June 6. Other officers elected include: Vice president, L. F. Burress, coke plant superintendent, Illinois Steel Co., Gary Ind.; and secretary, H. W. Johnson, blast furnace superintendent, Inland Steel Co.

The meeting was devoted to golf in the afternoon with a technical session in the evening. Speakers at the latter included H. A. Strain, blast furnace superintendent, South works, Illinois Steel Co., and W. H. Geesman, blast furnace superintendent, Gary works, Illinois Steel Co.

Steel Ingot Rate in May Near 1933 High

MAY production of open-hearth and bessemer steel ingots, at 125,807 gross tons daily, was the largest with the exception of July, 1933, (128,152 tons daily) since June, 1930. This high daily average engaged steelmaking capacity at 58.06 per cent, only fractionally below the peak of last July, which was 58.95 per cent.

In five months of 1934 ingot production has totaled 13,338,035 tons, or more than double the 6,391,675 tons of the first five months of 1933. In fact, the first five months of 1934 were more than equal to the first seven months of last year, even including the late summer bulge then.

Thus far in 1934 the daily average of steel production has been 102,600 tons, or 47.35 per cent of capacity, compared with the average of 73,801 tons and an operating rate of 33.95 per cent for all 1933, according to the American Iron and Steel institute, New York.

Steel Ingot Production — 1933-34

96.57 Per Cent of Industry Reporting
Gross Tons

1933	Open-hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	No. of working days	Approximate daily output all companies	Per cent operation
Jan.	885,743	109,000	994,743	1,030,075	26	39,618	18.23
Feb.	922,806	126,781	1,049,587	1,086,867	24	45,286	20.83
Mar.	784,168	94,509	878,677	909,886	27	33,699	15.50
Apr.	1,180,893	135,217	1,316,110	1,362,856	25	54,514	25.08
May	1,716,482	216,841	1,933,323	2,001,991	27	74,148	34.11
5 Mos.	5,490,092	682,348	6,172,440	6,391,675	129	49,548	22.79
June	2,211,657	296,765	2,508,422	2,597,517	26	99,904	45.96
July	2,738,083	355,836	3,093,919	3,203,810	25	128,152	58.95
Aug.	2,430,750	376,370	2,801,120	2,900,611	27	107,430	49.42
Sept.	1,991,225	242,016	2,233,241	2,312,562	26	88,944	40.92
Oct.	1,847,756	191,673	2,059,429	2,111,866	26	81,226	37.37
Nov.	1,331,091	156,939	1,488,030	1,540,882	26	59,265	27.26
Dec.	1,624,447	132,787	1,757,234	1,819,648	25	72,786	33.48
Total	19,665,101	2,428,734	22,093,835	22,878,571	310	73,801	33.95
1934	**98.10 Per Cent of Industry Reporting**						
Jan.	1,786,467	172,489	1,958,956	1,996,897	27	73,959	34.13
Feb.	1,993,638	175,873	2,169,511	2,211,569	24	92,147	42.53
Mar.	2,540,143	203,904	2,744,047	2,797,194	27	103,600	47.81
Apr.	2,622,372	257,482	2,879,854	2,935,631	25	117,425	54.19
May	3,000,624	331,620	3,332,244	3,396,783	27	125,807	58.06
5 Mos.	11,943,244	1,141,368	13,084,612	13,338,035	130	102,600	47.35

Figures exclude crucible and electric ingots. All the operating percentages are based on 67,386,130 gross tons annual capacity as of Dec. 31, 1932.

WINDOWS OF WASHINGTON

WASHINGTON

UNOFFICIAL observers at Washington regard steel executives, in the present strike threat, as being held in a pair of pincers. The outcome depends a great deal on the extent to which pressure is applied by the administration.

It is recalled that when the automobile strike was called, automobile manufacturers took much the same firm attitude which the steel leaders have taken during the past week. Much as in the the case of the present steel situation, General Johnson was the President's right arm in dealing with the automobile and labor leaders.

When the smoke cleared away, the automobile executives found themselves under the necessity of recognizing the unions, at least as representatives of the union employes, and since then there has been a continual nibbling, with a measurable improvement in the position and power of organized labor. For instance, it is noted that the settlement of the strike at Toledo included recognition of organized labor.

Labor Leaders Await Blessing

One claw of the pincers that is gripping steel executives is the labor policy of the present administration. Labor leaders, as a result of administration utterances and policies, for many months have seen themselves at the threshold of the promised land. They have reached the end of their patience and want a realization of the promises which have been made to them. And the administration has placed itself in a position in which it cannot ignore this rising crescendo of complaint and demand.

The other claw is the steel code. It is believed in Washington that the steel code has been the salvation of the steel industry in this country. It is officially felt here that had the chaotic condition of competition continued in the steel industry, much major financial disintegration would have occurred by this time. It is known that the steel industry likes its code and wants to keep it. In the code, it is felt here, the administration has a weapon which will enable it to impose its will.

The steel strike issue now overshadows all other labor issues here. As the automobile strike settlement clarified the labor atmosphere as of that time, so the steel strike settlement will undoubtedly clarify the atmosphere for a time to come. The President is expected to show his hand without delay. His utterance on the steel strike, it is believed, will determine the immediate disposition of the revised Wagner bill which alternately has been on the list of "must" bills and the list of those to be put over till the next session of congress.

Open Prices Still Under Fire

In the meantime, the feeling at Washington is that the steel leaders will be forced to recede from their position to some etxent—at least to the extent of dealing with organized labor leaders as representatives of their membership employed by the steel companies.

There is another angle of the existing situation which the steel industry may as well bear in mind in its present deliberations. That is the intense and powerful opposition against the price and basing point provisions of the steel code to which the new NRA price policy attests. It is regarded as highly unlikely, for instance, that the joint NRA-FTC study of steel prices now in progress will result in any complete endorsement of the revised steel code.

In influential agricultural circles there is much opposition to price provisions such as those in the steel code. In other words, it is entirely possible that in another six months to a year the steel industry will have lost much of the value of the code, while at the same time having lost ground permanently on the labor front.

Though generations yet unborn will pay for the job, the soil-saving campaign being conducted by the present administration is regarded in Washington as worth every cent it is costing. Soil erosion now is proceeding at the alarming rate of 77 tons of soil for the average tillable acre annually. The loss equals the annual destruction of 1250 farms of 160 acres each. It includes the choking of navigable streams, reservoirs, canals and ditches with soil from formerly rich farm lands.

Manufacturers of many different materials and products can count on a big, permanent market for all kinds of equipment and tools used in such soil-saving work.

Important in this soil-saving work is that of the forest service of the department of agriculture in reforestation and in protecting existing forests. The country's present average mark is 40,000 forest fires a year and the forest service is cutting roads and trails through the woods and erecting fire towers so that fires may be located and extinguished before they become uncontrollable.

Buy Wire and Steel for Towers

On June 19 the forest service will open bids on the biggest order for telephone wire ever placed by the government. It will involve 6542½ miles of wire, weighing 749 tons. Included is 3861 miles of No. 12 and 2681½ miles of No. 9. This wire will be used to place telephone connections in all fire towers not so equipped.

On June 5 the forest service opened bids on 162 fire towers, of galvanized steel or preserved wood construction. Since April, 1933, the forest service has bought some 330 of these towers, all steel, as steel up to the present has afforded cheaper construction than wood. The towers weigh 8 tons on the average and range in height from about 45 to 100 feet.

In the past two weeks the forest service has distributed orders for 357

tractors, 64 air compressors and 259 graders, as well as shovels and much miscellaneous equipment and hand tools.

Of the tractors, 259 went to Caterpillar Tractor Co. and 108 to the Cleveland Tractor Co. They weigh from 7000 to 32,017 pounds each.

Air compressors have been awarded as follows: Ingersoll-Rand Co. 17, Gardner-Denver Co. 8, O. K. Clutch & Machinery Co. 4, Chicago Pneumatic Tool Co. 6, Davey Air Compressor Co. 9, Schramm Co. 5, Sullivan Machinery Co. 8, Worthington Pump & Machinery Corp. 7. They will weigh 3000 to 8590 pounds each.

The graders will weigh 7000 to 13,000 pounds each and will be furnished by Galion Iron Works, J. D. Adams Co., Austin Western Road Machinery Co., Allis-Chalmers Mfg. Co. and Rome Mfg. Co.

The forest service is about to purchase 40 rock crushers.

Need Steel for Park Repairs

In the period since April, 1933, the forest service has purchased about $10,000,000 worth of tractors, graders, shovels, picks, air compressors, rock crushers and similar equipment for building forest roads and trails. Present purchases will take care of requirements up to next October.

The soil erosion service of the department of interior also is an important purchaser of such equipment. It now is about to award 12 diesel engine tractors. Incidentally, it is going over to diesel rather than gasoline-driven units. Other past and future requirements of this service, include graders, terracing equipment, dirt moving equipment, fresnos, elevating graders, rock crushers, air compressors, etc.

Bureau of public roads, department of agriculture, is another government agency participating in this work. Its activities cover national parks and forest and other roads, and most of its projects are placed under contract. It buys direct only in connection with small force-account jobs.

The bureau opened bids June 1 on the Shenandoah national park project, Virginia. This job will require some culverts, a small quantity of concrete reinforcing bars and miscellaneous steel. On June 20, bids will be opened on repairs and rehabilitation at the national park at Vicksburg. Included will be repairs to three bridges, involving 25,500 tons of structural steel, and a certain amount of welding and replacement of bolts and rivets. Most of the requirements in connection with these jobs are of a character to interest warehouses.

Further study of the national housing bill, expected to be passed at this session, convinced those familiar with this bill that the housing project will give a tremendous uplift to the expenditure of private funds throughout the country.

By this bill, the government would insure mortgage loans up to $2000 each, to cover reconditioning of homes and other structures, and construction of new homes and other buildings.

Several features of the plan are of great interest to the steel and fabricating industry. Requirements as a whole are expected to be enormous but individually they will be small. Hence, well-organized warehouse distributing facilities will be necessary to cater to this demand. Another feature is that borrowers will be aided in getting the best materials and equipment for their money; borrowers probably will be prohibited from spending the money for anything not on the government approved list.

That means that manufacturers will have to be prepared to demonstrate their products to the designated government representatives or agencies. The chief materials included will be steel, copper and brass sheets, pipe, wire, steel floor plate, hot water heaters, furnaces, electric wire, nails, builders' hardware, etc.

As to steel houses, opinion prevails rather definitely among government housing experts that no all-steel houses are likely to be approved in the near future for participation in this housing program. Rather, it is felt, possibilities are good for the approval of composite houses in which steel will be used as strength members, with the external surfaces and partitions of material other than steel.

Died:

W E. RICE, chief draftsman of Massillon Bridge & Structural Co., Massillon, O., division of the Fort Pitt Bridge Works, Pittsburgh, in Massillon, June 5.

□ □ □

W. M. MacKennney, 62, president, Butler Engine & Foundry Co., Butler, Pa., in that city, June 4.

□ □ □

Montgomery Smith, 71, formerly purchasing agent of the Pennsylvania railroad at his home in Germantown, Pa., June 5.

□ □ □

Fred W. Bunts, 67, for 35 years a salesman in the Chicago office of the Jones & Laughlin Steel Corp., at his home in Chicago, June 6. At one time he was associated with the Warner & Swasey Co. in Cleveland, where he was born.

□ □ □

Fred C. Eckworth, 49, Cleveland manager of the Crocker-Wheeler Electric Mfg. Co., in a Cleveland hospital, June 1. He had been a member of the company's sales force for 18 years, and was widely known in the iron and steel industry of the district.

□ □ □

John Hannan, 54, sales manager of the Pittsburgh Tube Co., Monaca, Pa., in Pittsburgh, June 7.

□ □ □

Raymond Manley, 46, for many years chief chemist for the Norton Co. at its Chippewa, Ont., plant, in Niagara Falls, N. Y., May 31.

□ □ □

Jacob A. Williams, 54, president of the J. A. Williams Co., wholesale hardware, Pittsburgh, in that city, June 3.

□ □ □

Michael P. Sullivan, 58, manager of the Hillman Supply Co. stores, with which he was associated for 35 years, in Pittsburgh recently.

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David Bell, 59, president of the David Bell Co., Buffalo, screw machine products, at his home in Buffalo, May 21.

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George M. Crownover, 71, for the past 18 years associated with the Oxweld Railroad Service Co., Chicago, and for a number of years previously identified with various western railroads, at his home in Chicago, June 5.

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Wiliam E. Sharp, 64, recently president of the Grip Nut Co., Chicago, manufacturer of railway supplies, at his home in that city, June 4. He joined the company in 1911 as vice president, becoming president in 1916.

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Emil L. Claus, 67, Milwaukee inventor and machine tool designer, in Milwaukee, May 30. Born in Germany, he came to America in 1883. For many years he was associated with the Lutter & Geis Co., Milwaukee, as designer of lathes and planers.

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William J. Ferris, 72, nationally known retired electrical engineer, at his home in LaCrosse, Wis., June 1. A native of Scotland, for 19 years he was associated with the General Electric Co. in Chicago, and for seven years resided in Panama as chief engineer of Canal Zone electrical properties of the Electric Bond & Share Co. He retired in 1926.

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John T. Dillon, president of the Lake Erie Engineering Co., Buffalo, the Struthers-Wells Co. and the Titusville (Pa.) Iron Works, in New York, June 4, following a short illness. He had been active in machinery manufacture for over 30 years, and was a director of the Warren Axle & Tool Co., Warren, Pa., as well as of several other companies and banks in Buffalo, Titusville and Warren.

Industrial Men in the Day's News

Dr. D. S. Jacobus, New President, American Welding Society

Long before welding had reached commercial acceptance, he was making experiments with cutting torches.

A world authority on steam engineering, his activities spread over numerous lines of technology.

He was instrumental in bringing about liberalization in specifications for welding of pressure vessels.

DR. D. S. JACOBUS, recently elected president of the American Welding society for 1934-35, is a pioneer in the welding field, as early as 1897 making experiments with the use of the oxyacetylene torch in the cutting of thin steel.

Born in Ridgefield, N. J., he was graduated from Stevens Institute of Technology in 1884, teaching experimental mechanics and engineering of physics there from 1884 to 1906, when he was awarded the degree of doctor of engineering. He then joined the Babcock & Wilcox Co., New York, as advisory engineer, and is now head of that company's engineering department.

He is author of numerous technical papers and is considered one of the world's authorities on steam engineering. In 1906-07 he served as president of the American Society of Refrigerating Engineers, and in 1916-17 as president of the American Society of Mechanical Engineers.

He is chairman of the executive committee of the boiler code committee of the welding society, and gradually brought about a liberalization of the rules dealing with the welding of pressure vessels, keeping in mind, however, suitable safety provisions so that at the present time there is no limitation on the use of welding for any thickness or size of pressure vessels providing the welding is done properly and meets required tests.

He has been a member of the board of directors of the American Welding society for several years, as well as a member of the executive committee.

He is also a member of the American Institute of Mining and Metallurgical Engineers, American Institute of Electrical Engineers, Society for the Promotion of Engineering Education, Franklin institute, Society of Naval Architects and Marine Engineers, American Association for the Advancement of Science, the Holland Society of New York, and the American Mathematical society.

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L. S. Hamaker, sales promotion manager of the Republic Steel Corp., Youngstown, O., has been appointed vice president and general manager of the Berger Mfg. Co., Canton, O., a division of Republic. He has been in charge of sales promotion and advertising for Republic since 1930, and is widely known in the steel industry for his aggressive work in developing a merchandising-mindedness among producers.

Joseph B. Montgomery, associated with the Berger company since 1919, has resigned as vice president and general manager, a position held since 1930. For several years before the World war, he was sales representative for the Carnegie Steel Co. in Richmond, Va. Lately he has been active in assisting administration of the NRA code for the business furniture, storage equipment and filing supply industry.

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E. V. Walsh, former vice president in charge of sales and advertising for the Timken Silent Automatic Co., Detroit, has been appointed sales manager of the air conditioning division of the Campbell Metal Window Corp., Detroit, subsidiary of American Radiator & Standard Sanitary Corp.

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R. L. Rickwood has been appointed works manager for the Reed-Prentice Corp., Worcester, Mass. He was formerly associated with the Worthington Pump & Machinery Corp., Harrison, N. J., and at one time with the Cincinnati-Bickford Tool Co., Cincinnati.

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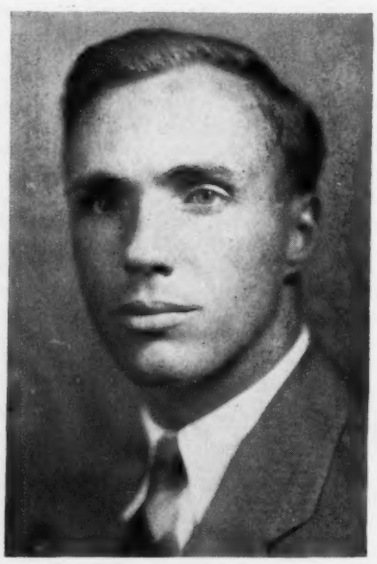
R. S. Archer has been appointed chief metallurgist of the Chicago district of the Republic Steel Corp., Youngstown, O. He has been director of metallurgy for the A. O. Smith Corp., Milwaukee, and prior to that was in charge of the Cleveland section of the Aluminum Research Laboratories, Aluminum Co. of America. He is a graduate of the University of Michigan, author of numerous technical papers and co-author with Dr. Zay Jeffries of *The Science of Metals*.

He is a past chairman of the Cleveland chapter of the American Society for Metals and for some years has been a member of the recommended practice committee of that society. As announced in STEEL last week, Mr. Archer recently has been nominated for vice president of the society, at present being a trustee. He is also chairman of the committee on data sheets of the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers, and a member of the executive committee of the Chicago section of this group.



Robert S. Archer

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Maj. Hugh C. Minton, army ord-

nance department, Washington, has been designated to bring up to date the government plan, worked out seven years ago, for utilization of the steel industry in the event of war. He

Maj. Hugh C. Minton

will begin this work Sept. 1, in conjunction with the American Iron and Steel institute. He was appointed to the army from Virginia in 1917 and rose to the rank of major of field artillery. In 1919 he was transferred to the ordnance department with the peace-time rank of captain. He is considered one of the best-trained steel men in the army, for a number of years specializing in steel research at the Watertown arsenal, Watertown, Mass. He is a graduate of Virginia Polytechnic institute, as well as the ordnance school of technology and the army industrial college.

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Bertram D. Thomas, graduate of the University of Washington and specializing in physical chemistry, has been appointed to the staff of Battelle Memorial institute, Columbus, O. His initial research on colloids will be in the laboratories for dressing iron ores and coal preparation.

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Louis C. Lustenberger, of the Carnegie Steel Co. sales staff at Pittsburgh, was appointed assistant to the vice president and general manager of sales, assigned to special sales duties effective June 1. For some time he has been handling sales of slabs, billets, sheet bars and other semifinished steel products, and is well known throughout the steel industry.

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Lee B. Green, formerly works manager for the Globe Machine & Stamping Co., Cleveland, has been named a director and vice president in charge of operations. His early engineering experience was obtained with the Morgan Engineering Co., Alliance, O. Later he became a designer on the engineering staff of the Cleveland Frog & Crossing Co. Other affiliations have been: Chief engineer of the Stereo-

Lee B. Green

type Co., Indianapolis; general master mechanic of the Timken Roller Bearing Co., Canton, O.; and superintendent of the Lincoln Motor Co. He was appointed works manager of the Globe company in 1929.

Ryerson St. Louis Warehouse Now Air-Conditioned for Steel

JOSEPH T. RYERSON & SON INC. has greatly increased its facilities for storing and dispatching steel and allied products in the St. Louis area by extending one of the large spans of its St. Louis plant 165 feet and erecting a new building across the east end of the main warehouses.

The greater part of the additional 40,000 square feet of floor space is given over to warehousing products requiring special protection from atmospheric changes. A circulating warm air heating system provides the necessary distribution of heat for the proper storing of sheets, tool steels, welding rod, cold-finished bars, bands, hoops and other high-grade steel.

On the second floor of the new building are modern daylight offices equipped with an air conditioning and cooling system. Motor trucks back into a recessed pit in the new span, bringing the floor of the truck level with the floor of the building. The new spans are served by railroad spurs, and stocks are currently being increased.

A number of new products and sizes are being stocked, making available in the St. Louis territory a large and diversified supply of steel and allied products.

EDITORIAL

Who Is the Real Friend of American Employes Today?

THREE employers in a city in the Middle West were confronted with a strike fomented by professional labor agitators from a distant city. After a few days of strife, in which numerous heads were broken, the employers agreed to a truce, although they realized that only a few of their employes sympathized with the strike.

The action of the employers in submitting the case to arbitration, if it came to the attention of Washington, probably was considered by the present government administration as a sign of a broad-minded, liberal attitude in dealing with labor relations.

But before passing judgment, consider what actually happened, as a result of arbitration in this case. The terms of settlement provided for a slight increase in wages and recognition of the "union." This meant that for fear of bodily injury all employes joined the union, whether or not they desired to. Each employe now receives slightly more in wages than he did before the strike, but after his "union" dues are paid (not counting initiation fee) his wages are less than they were before the strike.

Employes, Employers and Public Are Losers; Racketeers Sole Recipients of Benefits

The net result is as follows: The employers pay out more in wages. The employes have suffered what amounts to a wage cut. They are under the domination of outside thugs who care nothing about labor relations, and who probably will call strikes whenever they need more money. The public is worse off because the reign of harmony which existed under the old regime has been replaced by a situation which will necessarily mean frequent periods of violence. The public also will eventually pay for the higher cost of operation. Anyway one looks at the case, the only gainers are the outsiders who staged the strike.

The Washington administration has heaped criticism and abuse upon the heads of employers who have resisted the government's brazen attempt to turn industry over to professional labor domination. But, in all fairness, are the employers who resist as guilty or as false to their trust of responsibility to their employes as were the three employers who spinelessly "sold out their employes to the bondage of racketeers?"

When the final chapter of the present absurd and needless labor mess has been written, the public, employers and employes will unite in paying tribute to the staunch, enlightened leaders of industry—particularly in the steel and automotive fields—who, penetrating the smoke screen of petty, political subterfuge, realized the danger of playing into the hands of professional labor union leaders at the instigation of a misguided federal administration.

Industry Not Antagonistic to Legitimate Labor Movement; Asks Only for Square Deal

Industry has no particular grudge against legitimate, honest, professional labor unions. Most industrialists will admit freely that the union labor movement, as directed by conscientious leaders, has been beneficial in many ways. The majority of employers will agree that insofar as a well conducted professional union can offer services to employes which are superior to the services rendered by any other agency, the union should have free opportunity to function. But what industry objects to strenuously is the unfair tactics of the present administration in attempting to rule by interpretation, by innuendo and even by law that employes will be served better by professional labor unions than by employe representation plans or any other form of bargaining.

Industry is willing to subscribe wholeheartedly to Section 7a of NRA or to any other fair statement of the principle of collective bargaining. The American Iron and Steel institute, in its admirable pamphlet, "Collective Bargaining in the Steel Industry" (which is the best statement yet issued on the position of the steel industry in the present labor controversy) reaffirms its belief in the principle of collective bargaining and in Section 7a.

The key to the entire problem lies in the freedom of employes to make their own choice.

The latest Wagner bill, and in fact any labor act promulgated by the present administration, is likely to enforce by law the injustices meted out to helpless employes by the "arbitration" cited at the beginning of this discussion.

Enlightened employers in the steel and automotive industries are fighting for personal freedom for about 90 per cent of the gainfully employed workers of the nation. The administration, ostensibly believing it is working for the interests of all employes, actually is playing into the hands of racketeers and in doing so is discrediting the legitimate union labor movement and its conscientious leaders, ignoring the public interest, betraying its pledge of a square deal to employes, needlessly penalizing employers and retarding recovery.

THE BUSINESS TREND

Business Holds Up Well in Face of Bearish Sentiment

NOTHING in sight on the horizon of business warrants the extreme pessimism which is encountered in some quarters. The slackening of industrial activity, which was indicated by preliminary setbacks in mid-May, has not developed to the degree expected.

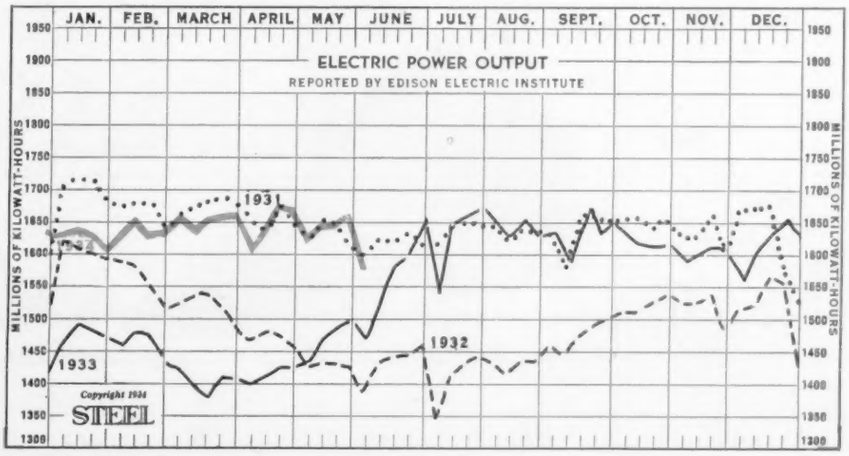
Even allowing for buying in anticipation of a strike, steelworks operations are at an encouragingly high level. Revenue freight car loadings, which constitute a broader barometer of business, are holding up surprisingly well. The weekly average for four weeks of May ending May 26 was 610,413 cars, which is only slightly below the 611,844 average for five weeks of March and is far in excess of the weekly averages for January, February and April. The report of pig iron output for May, showing the highest daily rate since April, 1931, and eclipsing by a substantial margin the peak of 1933, is significant of the underlying strength of the present situation. The pig iron production for five months of 1934, totaling nearly 8,000,000 tons, is the highest for any five consecutive months since the first quarter of 1931.

As far as current business records go, the chief cause for uneasiness lies in the apparent lack of consistent improvement in the construction and equipment industries. Such gains as have been made are spotty in character; the spark of life seemingly cannot be fanned into a flame of real activity. Heavy equipment orders have come forth in fitful jerks, supported by just enough new inquiry to afford encouragement but not enough to lend positive tone to the market. Machine tool orders are in greater volume, with some improvement in export business.

Durable Goods Committee Gave President Key To Problem of National Industrial Recovery

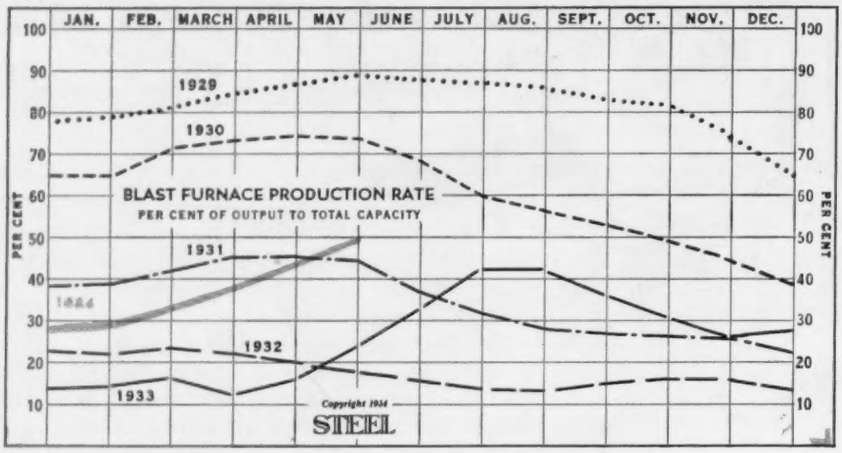
The solution of difficulties in these backward industries was ably presented in the report to President Roosevelt by the durable goods industries committee on May 28. In this report he will find specific suggestions as to what is necessary to revive these industries and to speed the entire program of national industrial recovery.

Important to watch in the remaining weeks of June will be the reaction of business to the adjournment of congress and to the probable evasion or semi-settlement of the threatened steel strike.



1934 Million Kw.-Hr.	
June 2	1,575
May 26	1,654
May 19	1,649
May 12	1,643
May 5	1,632
April 28	1,668

1933 Million Kw.-Hr.	
June 3	1,461
May 27	1,493
May 20	1,483
May 13	1,468
May 6	1,435
April 29	1,427



	Per Cent
May, 1934	48.0
April, 1934	42.0
May, 1933	38.0

115 Blast Furnaces Active At End of May

With the total output of pig iron exceeding the two million-ton mark in May, operating blast furnaces reached a total of 115. In the last five months, operating blast furnaces increased 41 from 74 on Dec. 31 to 115 on May 31. On May 31, 1933 only 61 furnaces were producing iron. The upturn in May represents a gain of 6 stacks over the 109 active on the last day of April. During the current month, 7 stacks were placed in operation and only 1 was blown out or banked. Relating production to capacity, the operating rate for May was 48.0 per cent, compared with 42.0 per cent in April and 38.0 per cent in March. In May 1933 the rate stood at 20.9 per cent.

April Iron and Steel Export Trade Down Sharply

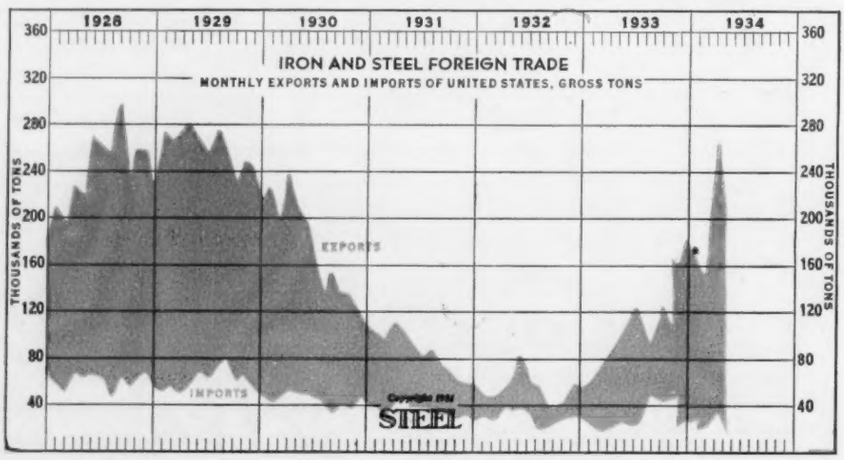
Both exports and imports of iron and steel products declined sharply in April. Exports during the fourth month totaled 202,539 tons compared with 261,269 tons in March, and 100,-395 tons in April, 1933. In four months of 1934 exports totaled 793,015 tons, against 301,567 tons in the same period of last year. Imports in April totaled 26,862 gross tons, a sharp decline from the 38,393 tons in the preceding month, but almost equal to the 28,061 tons of April, 1933. According to the iron and steel division of the department of commerce, in four months, imports have totaled 113,313 tons compared with 91,518 tons in the comparable period of last year.

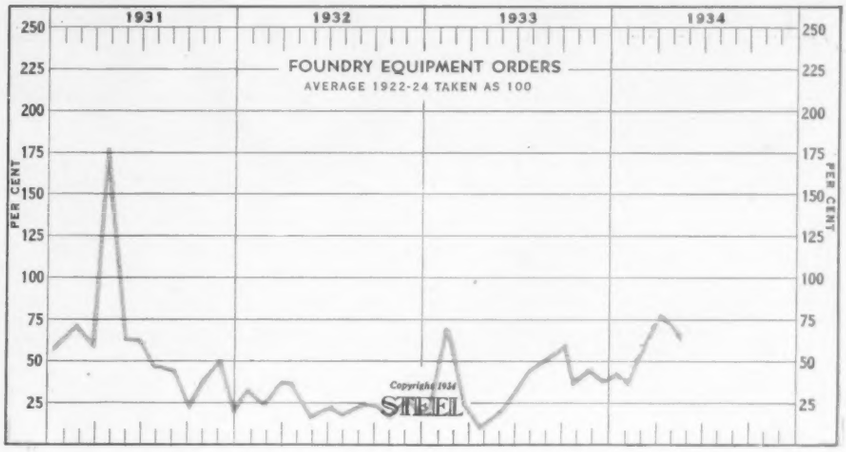
Exports

	Tons
April, 1934	202,539
March, 1934	261,269
April, 1933	101,395

Imports

	Tons
April, 1934	26,862
March, 1934	38,393
April, 1933	28,061





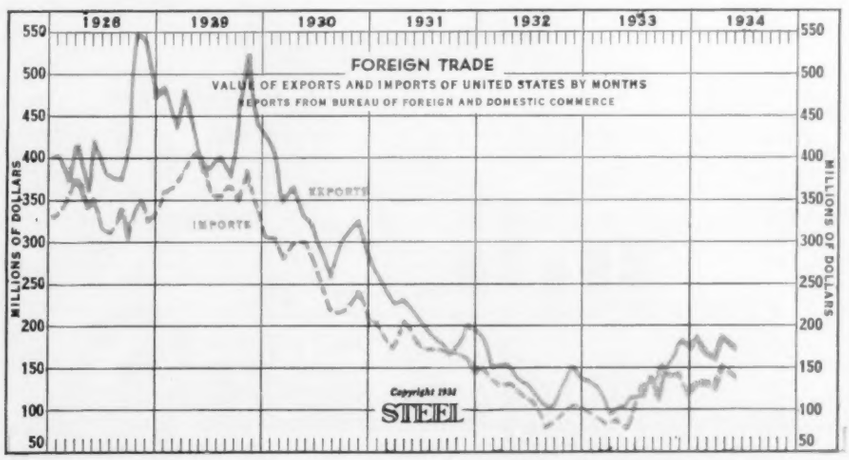
	Per Cent
April, 1934	67.9
March, 1934	75.4
April, 1933	19.4

Foundry Equipment Orders Point Downward in April

After showing an encouraging recovery during February and March, the trend of foundry equipment orders pointed downward in April. According to statistics compiled by the Foundry Equipment Manufacturers' association the order index stood at 67.9 compared with 75.4 in March and only 19.4 in April, 1933. The March index was the highest point reached since the brief spurt in March, 1931 when the index registered 174.4. The index of shipments in April was 55.5 and compares with 62.6 in March and 55.1 in April, 1933. Unfilled orders, however, did show an increase from 51.5 in March to 63.0 in April and compares with 14.7 in April, a year ago.

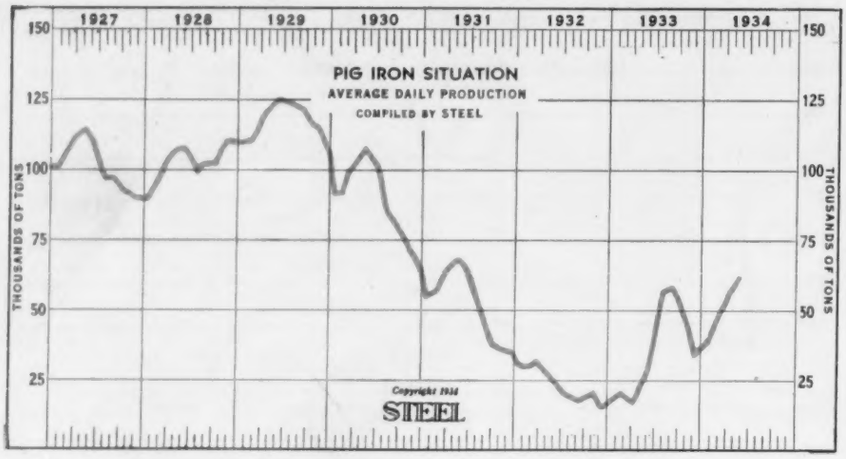
Foreign Merchandise Trade Off Slightly in April

The foreign trade statement for April, issued by the department of commerce, shows a slight reduction from the preceding month. The value of merchandise exported during the fourth month was $179,444,000 while imports were valued at $146,517,000 leaving an export trade balance for April of $32,927,000. Exports in April were $11,571,000 smaller than those for March. This decline was almost entirely due to the reduction in the value of raw cotton exports. Exports in April, 1933 were valued at only $105,217,000 while imports declined to $88,412,000 the lowest point for any month in many years, excepting only the preceding February and July, 1932.



Exports	
April, 1934	$179,444,000
March, 1934	191,015,000
April, 1933	105,217,000

Imports	
April, 1934	$146,517,000
March, 1934	158,000,000
April, 1933	88,412,000



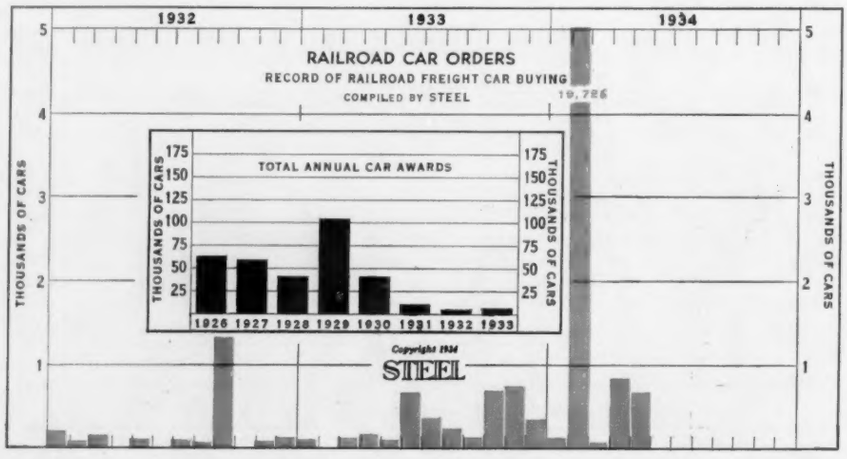
	Tons
May, 1934	66,274
April, 1934	57,873
May, 1933	28,784

May Iron Production Up Sharply; Highest Since April, 1931

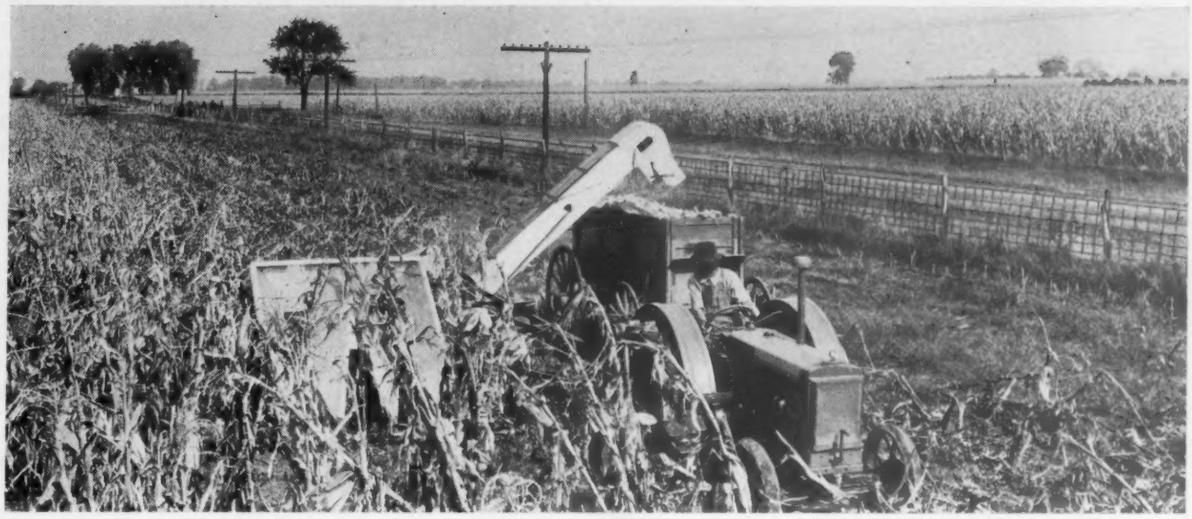
The average daily production of coke pig iron in the United States during May continues the unbroken climb from the low point in November, 1933. With the average daily output in May at 66,274 tons this brings the daily rate to the highest point for any month since April, 1931, when iron was produced at a rate of 66,986 tons per day. The average daily production in May increased 8401 tons, or 14.5 per cent, over the 57,873-ton rate of April while in May, one year ago, production was 28,784 tons per day. The daily output in May 1932 was 25,282 tons compared with the 64,355-ton rate in the corresponding month of 1931.

Freight Car Awards Down Moderately in May

Domestic freight car awards continue to show very little change for the better and awards in May involved 717 cars, of which 500 were for the Chicago Great Western and 200 for the Central of Georgia. This is a slight drop when compared with the 800 freight cars built in April but considerably higher than the 8 awards made in May, a year ago. During March awards totaled only 30 cars, 19,725 in February and 152 in January. May awards bring the total for the first five months to 21,424 cars. This is the largest five-month total since 1930 when 31,606 cars were purchased. In 1929 the total cars bought was 56,930 in the first five months.



May, 1934	717
April, 1934	800
May, 1933	8



OF THE total farm acreage in the United States approximately two-fifths is devoted to crops, fencing for which requires a large tonnage of steel

FARMERS BUYING MORE STEEL FENCING; SURVEY SHOWS NEEDS ARE HEAVY

BY A. J. HAIN
and W. G. GUDE
Associate Editors, STEEL

THIS year promises to mark another step in demand for wire and wire products from American farms. Farmers are buying fencing again, in considerable volume, a fact evident from replies to questionnaires addressed to them, as well as from visual observations by those particularly interested in their purchasing of manufactured products.

"A distinct improvement is noted this year in Ohio, one of the best markets for wire used for agricultural purposes," says W. H. Lloyd, editor, *The Ohio Farmer*, Cleveland.

"Recently I had occasion to travel through several other middle western states and everywhere it was apparent that farmers are replacing fences worn out during the depression, and are even extending the areas requiring new fences."

The Ohio Farmer recently made a survey of the fence markets in Ohio, learned how many farmers are buying such material this year, what types they prefer, and developed some interesting information. But first, a glimpse of the tonnage of steel absorbed in the agricultural districts of the country as a whole will prove to be an enlightening factor.

STEEL'S annual reports from practically all steel manufacturers show that in 1928 they shipped 538,776 gross tons of wire products for uses in all branches of agriculture and cattle raising. In 1929, the amount dropped to 471,436 tons; in 1930 to 360,766 tons; and in 1931 to 311,936 tons. The low point was reached in 1932, with 110,849 tons. Last year the amount increased to 204,736 tons.

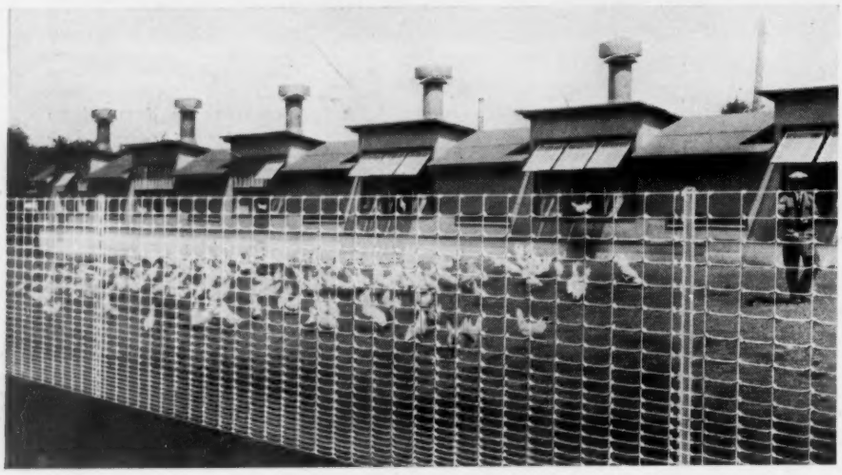
A certain proportion of this steel tonnage went into the manufacture of implements and other farm equipment, but it was 7 to 8 per cent of the total.

The nation's agricultural requirements last year absorbed 14.7 per cent of the entire output of wire products, amounting to 1,385,853 tons. Agriculture's share of this, as stated, was 204,736 tons. Jobbers took 503,562 tons, and it is probable a considerable portion of this eventually went to farm communities, though farmers as a rule do not buy direct from jobbers.

Reports indicate 413,123 tons of rolled steel products of all kinds last year went directly into prod-

ucts absorbed in farming; and it will be noted that wire products constituted nearly one-half this total. As compared with 204,736 tons of wire products for farm purposes, last year the automobile industry purchased only 82,976 tons of wire products; and the building industry only 83,214 tons.

These figures show that farmers, notwithstanding their "hard times," were the best single class of customers for wire products, and that the bulk of wire products shipped to farms are fences or material for building fences. Over and above this, farms also represent an important market for steel fence posts, and such posts are gaining favor steadily, although where wood is plentiful and inexpensive it still is a formidable competitor.



Square mesh wire fence, as well as netting, is used extensively for poultry farms

The 1930 census gives the land areas of farms in the United States as 986,771,016 acres, and the number of farms as 6,288,648, indicating an average of 157 acres to a farm. This includes pasture lands, woodland not used for pastureage, crop areas and all other land used for farming and live-stock raising.

The average acreage per farm in the entire country was a little higher than the 125 acres average in Ohio shown by farmers' reports to *The Ohio Farmer*. Four hundred and ninety Ohio farmers reported they have a total of 321,500 rods of fence on their farms, or an average of 656 rods (10,824 feet) to a farm.

One of the questions asked the Ohio farmers was "When did you last buy fence?

Of the 471 who replied to this, only 79 purchased in 1932, whereas 180 bought in 1933. It appears that the business was at least twice as good last year as in the year preceding. STEEL's reports for the country as a whole showed that nearly twice as much wire products tonnage was absorbed by the farm in 1933 as in 1932.

But a question more to the point was how many farmers intend to buy in 1934. All who returned their questionnaires replied to this—518. Five hundred and ten stated they expect to make purchases this year; six said "perhaps"; and only two replied "no."

If this ratio is carried out on a nation-wide scale, the wire products sales to agricultural interests this year should be more than double what they were last year. Current drouth conditions unquestionably will prove an unfavorable factor, cutting down the farmer's purchasing power just as he was emerging from the depression, though the need for replenishment will remain strong, as indicated by all those farmers stating their intention to buy.

Farmers who expressed definite intent to buy said they would purchase a total of 19,492 rods, or 321,618 feet. The types of fences were not stated, though generally speaking the square mesh type represents a larger tonnage than any of the others. Plain wire is used in only relatively small quantities and barbed wire costs nearly as much alone as a woven fence itself. The agricultural districts, however, offer the best market for barbed wire, less than 5 per cent of the total production being bought for urban use.

Wood fences are rapidly becoming extinct. Of 612 Ohio farmers who replied to a question as to what kind of fence owned at present, 501 said wire, of various types, and the others replied "all kinds," meaning wood and hedge as well as wire, presumably. Only 72 said "rail." And one, sarcastically, merely said his fence was "the poorest there is." These farmers are a frank lot, when telling it to the editor.

Their sales inclinations as well as their sales resistances are indicated in great detail in their replies to the questionnaires. For example, 1000 had the time and patience to explain the particular features they consider important in fence. A large portion replied "galvanizing"; many "rust-resisting"; one's anwswer was "build a stainless steel fence at reasonable cost." Other replies related to specifications for size, weight and so on.

Of 517 who answered the question as to what kind of posts they preferred 252 said "wood"; 192 replied "steel," or steel and wood or steel and concrete. One replied "wood and concrete," and another "the cheapest."

Some figures from other states indicate the investment farmers have in their fences. V. S. Peterson, agricultural extension engineer, Iowa State college, Ames, Iowa, says Iowa farmers have an average fence investment of $374 per farm, and a total of $31,000,000. Prof. William Boss, of the department of agricultural engineering, University Farm, St. Paul, states the farms in Minnesota average $300 investment in fence, or a total investment of $55,500,000.

A survey of 30 farms by Prof. William Aitkenhead, head of the department of agricultural engineering, Purdue university, Lafayette, Ind., showed they averaged a fence investment of $1500 each, or 10 per cent of the value of the farm.

Use Determines Type of Fence

Fencing is manufactured in different gages and spacings of wire, with height and weight varying according to the particular application. Enclosures for horses, cattle, sheep and hogs commonly employ fence varying from 26 to 55 inches in height and using from 7 to 11 horizontal bars. Vertical stay wires are spaced 6 or 12 inches apart. The most popular type has 9-gage wire for the top and bottom wires and 11-gage for the intermediate and stay wires, this fencing weighing from about 7 to 12 pounds per rod for the different heights with 12-inch stays used and from 9 to 16 pounds when the stays are 6 inches apart. A height commonly used is 47 inches, weighing 14 pounds per rod for 6-inch stays, and is adapted to most fencing requirements in liyestock raising.

When heavier fence is required, fence with 7 or 9-gage wire throughout is available, weighing as much as 23 pounds per rod, although this type has a more restricted market than the above-mentioned grades. Close-mesh hog and cattle fence, used extensively in southern states, is made with 11 to 13 horizontal bars in heights ranging from 34 to 46 inches. Ten gage material comprises

Steel fence posts are preferred by farmers where the right kind of wood is unavailable or the price of wood posts is too high

the top and bottom wires and 21½-gage the intermediate wires.

Best markets for fence are in the Middle West, where cattle raising is concentrated, in addition to Texas, Oklahoma, New York and Ohio. Such states as Iowa, Kansas, Minnesota, Nebraska, Wisconsin, Missouri, Illinois and South Dakota comprise the leading livestock raising district. Poultry fence demand is confined principally to these same states, most active areas being Iowa, Missouri, Illinois, Texas, Kansas, Ohio, California, Minnesota, Pennsylvania, Indiana and Nebraska.

Poultry, garden and rabbit fence is close meshed and is manufactured in heights from 35 to 58 inches, with 16 to 21 horizontal bars. The type most commonly used has a combination of 11 and 14½-gage wire, the weight varying from about 8 to 14 pounds per rod. A popular height weighs about 9 pounds per rod.

Three Common Steel Posts

Steel posts commonly are made of tees, U-shaped sections or angles. The tee and U types are the most popular, accounting for the bulk of total production and are the strongest and most durable. Angle posts, however, are able to compete with cheap wood posts. Studs are rolled on the first two types mentioned to provide an anchorage for the clips which attach the fence. Some tee posts have punched holes which are used in fastening the fence. Angle posts also are punched for the clip attachment, or may have a tongue punched in them, to be bent closed when the fence wire is hung.

Tee and U fence posts vary from 5 to 8 feet in length, popular sizes being 6, 6½ and 7 feet, which weigh from about 8½ to 10 pounds. Angle posts of the same length, made of 1¼ x 1¼ x 9/64-inch angles, weigh from slightly over 7 pounds to about 8½ pounds. Recommended practice is the spacing of not less than one post per rod of fencing, although this will vary with type and size of fence installation.

Anchor plates are attached to the ends of the posts to hold them in the ground. These ordinarily are riveted to the post. One manufacturer has eliminated shearing of rivets by shrinking the anchor plate on the post.

Leading market for fence posts, as for fencing, is in the Mississippi Valley states, particularly the cattle raising sections. Because of economical reasons wood posts have received the call over steel during the past several years, although the latter material gradually is replacing the less durable wood.

Railroads also have been light buyers of posts recently, in line with their curtailment of all purchases, but ordinarily account for a fairly large volume of business. Government buying lately has been an important factor, this being for Indian reservations, parks and for the reclaiming of land to be leased to ranchers. Agricultural areas require only relatively small lots of posts for grain fields, livestock states being the heaviest buyers.

How To Insure Clean Cut Threads on Fiber

C. S. Stilwell, sales manager, Warner & Swasey Co., Cleveland, reports an incident which offers a solution for a problem in cutting threads on fiber material. One of the company's demonstrators found that in a certain large manufacturing plant the best operators were unable to cut clean threads on a fiber part. A die head was used, but the threads were ragged. Chases were reground and various lubricants were tried, but to no avail.

The solution came when an inquiring operator found that the fiber was stored in a stockroom where it dried out quickly. The material was placed outdoors overnight so that it would gather moisture. This treatment proved successful; thereafter perfect threads were cut with ease.

Report Shows Major Use of Nickel Is for Alloys

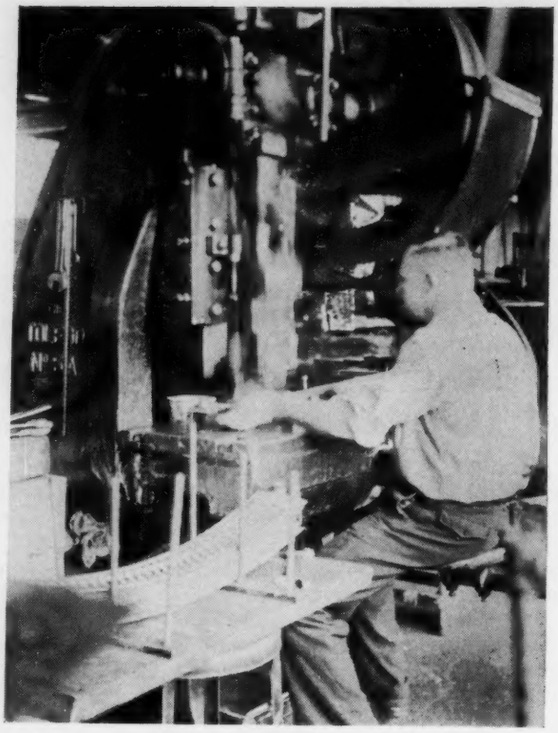
At the recent annual meeting in Toronto, Canada, of the shareholders of the International Nickel Co. of Canada Ltd., President Robert C. Stanley presented a statistical summary of the channels through which the nickel produced by the company goes into world consumption. The distribution of current output is as follows:

	Per cent
Alloy steel used in motor cars, trucks and buses	20
Nickel silver and nickel copper alloys for a multitude of uses	18
Pure rolled nickel in rods, strip, wire and tubes, used largely in the radio and chemical industries and for coinage	17
Alloy steel, inclusive of stainless steel, used in railroad equipment, farm implements, general machinery and miscellaneous applications	15
Nickel for plating and as undercoat in chromium plating	10
Monel metal used for engineering purposes and for household equipment	9
Alloy cast iron	4
Miscellaneous uses, including magnetic alloys, nickel brasses, nickel bronzes, nickel aluminum alloys and white gold	4
Heat resistant and electrical alloys	3
Total	100

The figures indicate the extent to which nickel depends for its markets upon combination with other metals in the production of special alloys. Only two categories, representing 27 per cent of total sales, can be described as being wholly devoted to pure nickel products.

Mr. Stanley stated that "as modern industry moves away from the simple metals toward alloys to meet the more exacting standards of performance, the unique position of nickel as an alloying element is an important factor in the development of wider, more diversified markets."

Variety of Metals and Equipment Required in Contract Stamping



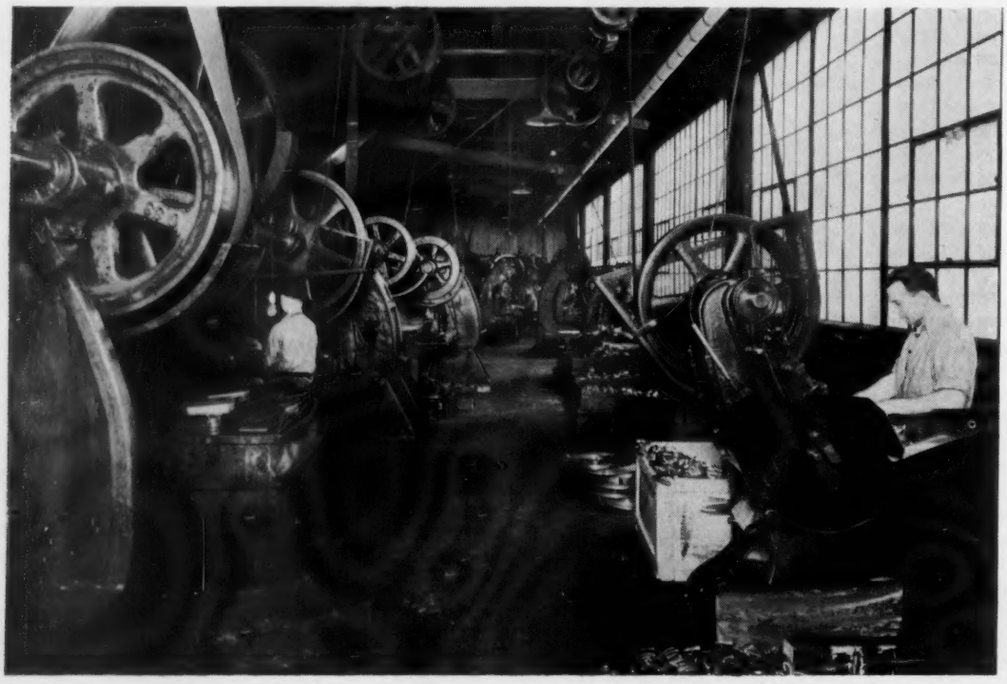
HIGH-SPEED blanking of invar struts for aluminum pistons. Material is a 35 per cent nickel steel, unusually hard. Stacks of scrap are shown in the foreground. Blanked pieces fall down a trough into a pan at the rear of the press

CONTRACT stamping work demands flexible equipment and the ability to adapt facilities readily and efficiently to different operations. Production may run from a few hundred pieces all the way up to several million. Planning for such varied production, designing and tooling up dies, and routing the work through on schedule calls for considerable ingenuity from management, press operators and all others concerned with production.

A company which for years has specialized in steel stampings, numbering and lettering dies, and tool and die work, and which more recently has made considerable progress in handling contract manufacturing requiring stampings, is the Dickey-Grabler Co., Cleveland. This company, in business since 1882, has witnessed many changes in the industrial scene along with the introduction of new products and the disappearance of other items which have lost favor in an advancing civilization.

The field of small stampings alone offers almost unlimited possibilities. In the list of many hundred parts which come in this particular classification might be mentioned such items as name-plates of all types, brass checks and workmen's badges, casket handles, emblems, advertising novelties, embossed signs, numbering tags for tire molds, pipe cutter disks, invar struts for aluminum pistons, perforated ventilator caps for buses and also numberless small parts for larger assemblies. This brief list well illustrates the striking variety of work encountered and suggests the different types and forms of material which are required for the work.

Practically all the common nonferrous metals, plain carbon steels, some tool steel and even some stainless steel at one time or another enters into the manufacture of the above products. To cite a typical example of how attention to material costs and finishing costs resulted in a saving in delivered price, there is a case of a flat, wing-shaped embossed emblem, supplied to a leading tire manufacturer



ROWS of presses, vertical and inclinable, of varying capacities, in operation on miscellaneous stamping work. At the left perforated ventilator covers for bus roofs are being formed. Operator at the extreme right is handling stamped steel casket hardware

GULF'S 7 POINT PLAN

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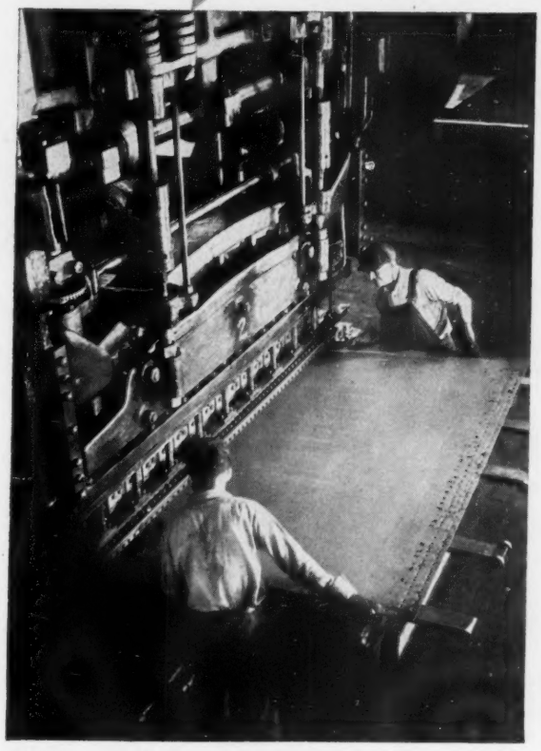
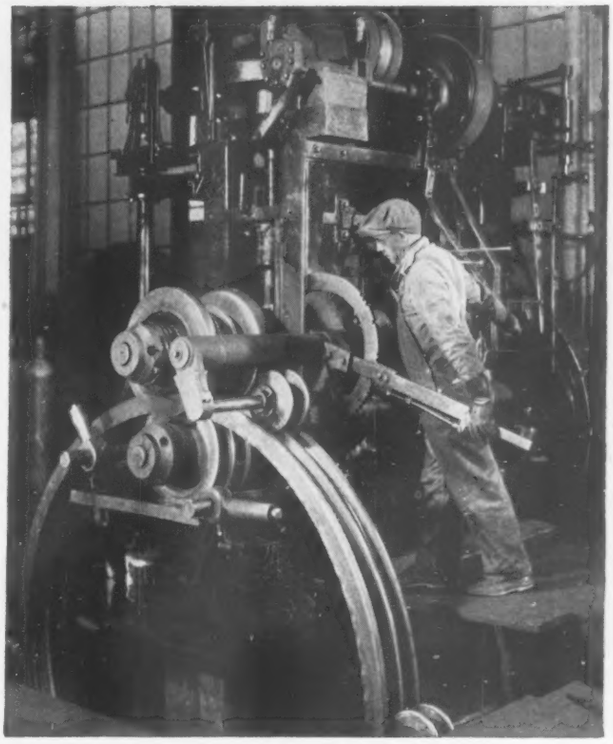
✓ CUTS OPERATING COSTS



This large multiple punching press, in the plant of the Parkersburg Rig and Reel Company, prepares sheets for oil storage tank construction. Precision and continuity of operation are of vital importance. Gulf lubricants and cutting oils keep all of the equipment in this up-to-date plant operating at top notch efficiency.



This tug rim rolling machine, of special design, is another important unit in the plant of the Parkersburg Rig and Reel Company. The rope grooves in tug rims must be in perfect alignment when placed in service. Gulf lubricants protect this costly machine from wear and operating trouble.

TO meet today's conditions, American industry finds it *imperative* to cut plant maintenance costs. Former yardsticks of efficiency fail to meet present day demands.

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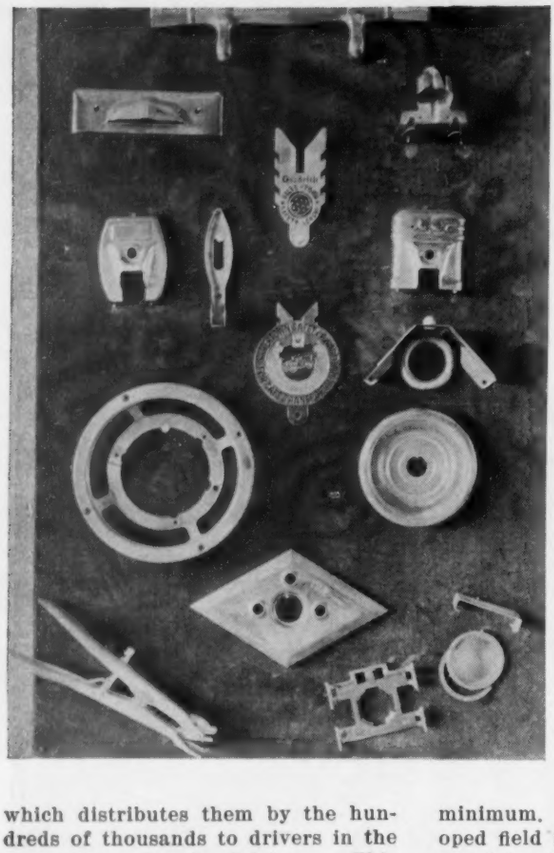

DISPLAY of a few of the hundreds of products produced in a contract stamping plant. The winged emblems in the center are of stainless steel. In the lower right-hand corner is a new type of fruit jar lid, comprising cap, rubber ring and clamping bar. The cap is stamped from special tinned strip steel

which distributes them by the hundreds of thousands to drivers in the promotion of safe driving. This emblem formerly was blanked from nickel silver, embossed with the required lettering, and the latter painted to contrast with the bright metal. By changing to 18-8 stainless steel, plating operations were eliminated and a lighter-gage material was used, the complete new emblem representing 30 per cent saving over the original design, despite considerably higher cost of the stainless steel. The latter is supplied in coils by the steel mill, buffed and polished to a bright finish.

High-Speed Presses Used

Two main lines of presses are installed in the plant, one group being known as serial presses, small units operating at high speed, with numbering dies which are changed automatically after each stroke of the press to number a series of metal tags or identification plates. Speeds as high as 10,000 pieces an hour are attained. Other presses suitable for miscellaneous work, some of them of the inclinable type in which the stamped part falls down a chute at the rear to tote boxes, are in constant use. Stock is fed in at one side automatically and the scrap falls into a container at the other side.

Various types of dies for embossing, lettering and similar purposes are made in the plant for use of customers. Experienced diemakers and flexible diemaking equipment are used to keep cost of such dies at a minimum. A recent newly developed field for this work has been in supplying lettering dies to manufacturers of steel beer barrels. The barrel manufacturer usually supplies barrels to the brewer with the latter's name embossed on one end of the barrel, and with the increased popularity of the steel beer barrel, a fair demand for lettering dies has developed. Similar dies are furnished for stamping metal signs in large sizes.

Dies Stored for Re-Orders

One section of this plant has been devoted to storage of old dies. Racks accommodating hundreds of die assemblies, each carefully labeled to provide ready access to any particular one, range tier on tier in one portion of the plant. Some of these dies stored are for parts stamped as long ago as 30 years. By keeping the dies stocked and carefully indexed, re-orders on any particular part may be handled with little or no delay. Facilities for changing dies, or rebuilding dies, caused by re-design, are of course in constant use.

On many stampings, close tolerances are specified, and in some cases dimensions of the stamping must be held within one or two thousandths of an inch. To insure the maintenance of those tolerances and to avoid rejects, all die assemblies are of the pin-die type, with the upper half of the die sliding on a vertical pin mounted in the base of the lower half. This makes possible continuous accurate mating of the two halves of the dies. Dies are usually of the plain carbon steel type, requiring no special heat treatment. Production on some runs as high as 1,000,000 pieces before recutting or resharpening is necessary.

Facilities are provided for heat treating, an electric pot-type furnace and various sizes of muffle furnaces being grouped together in one end of the plant. Oil and water quenching tanks are used. Spot welding equipment recently has been installed and is located conveniently for straight-line production methods.

Many stampings must be plated to meet service requirements and for this purpose the company operates a plating department equipped to handle copper, nickel, cadmium and chromium plating operations. Both barrel and rack-type plating tanks are used, depending upon the size of the parts to be plated. Cleaning solutions for removing dirt and grease from parts to be plated are adjacent equipment. Tumbling barrels are provided for tumbling stamped parts in saw-dust when necessary.

Among the novel specialties made from stampings by this company for many years are home savings banks —the small coin banks by which large banks encourage the opening of savings accounts by children— which are good examples of carefully made deep-drawn stampings.

Displays Feature Welding Methods, Metal Spraying

A demonstration of welding and metal spraying arranged by Metalweld Inc., Twenty-sixth and Hunting Park avenue, Philadelphia, and held in this company's plant May 21-23, was witnessed by purchasing agents, plant managers and chief engineers of leading industrial plants throughout the middle Atlantic states.

Among the many exhibits was a demonstration of the use of the oxygen lance in blowing a hole through the center of a large forged steel billet. Interest also centered around display of making a thermit weld, while the adaptability of electric welding for the maintenance of boilers was shown by operation of an electric welder on a boiler section, on which staybolts were renewed, sheet built up, tubes welded and renewed, a ring installed in the handhole and a section of the boiler patched.

The International Metallizing association co-operated in demonstrating various applications of metal spraying, such as building up shafts and rolls and coating metals for protection against corrosion and for decorative purposes.

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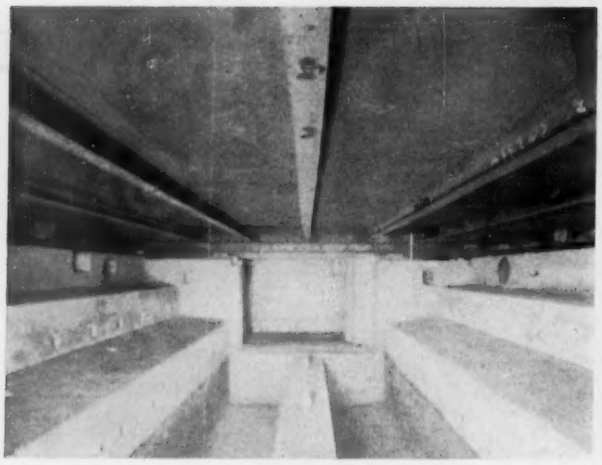


Fig. 1—Lower surface of completed floor ready for test

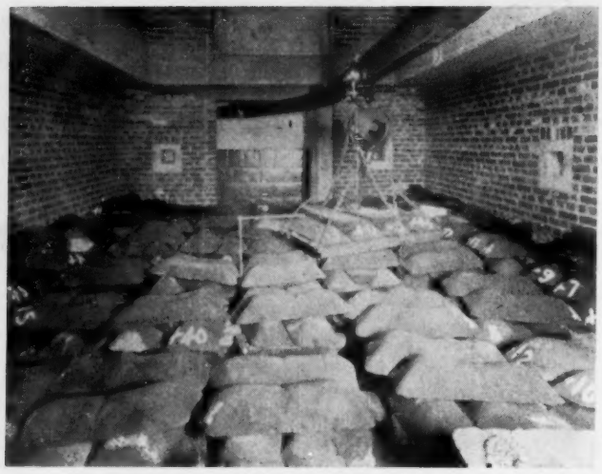


Fig. 2—Floor under nominal load of 420 lbs. per sq. ft.

Test of Battledeck Floor Yields Data on Beam Spacing

IN CO-OPERATION with the American Institute of Steel Construction Inc., the bureau of standards of the United States department of commerce recently conducted a load test of a flat steel-plate floor of the type developed by the institute and commonly known as the "battledeck floor."

The purpose of the test was to determine the strength of the floor and whether the following assumptions are justified:

(a) The floor behaves as a unit when loads are applied, i.e., the welds joining the beams and plates neither fail nor deform permanently.

(b) The entire width of the plate between beams may be considered as effective in computing stress and deflections.

Details of Test Floor

In conducting the test, the bureau constructed a section of the battledeck floor in a frame which is part of the bureau's fire resistance chamber. The test floor, having a span of 18 feet, consisted of six ¼-inch steel plates and seven 4-inch 7.7-pound per linear foot steel I-beams spaced 24 inches on centers. The four middle plates were about 23¾ inches wide and the two outer plates were about 32⅜ inches wide, extending 8½ inches over the outer beams. The arrangement of the test floor and the restraining frame is shown in Fig. 3. The edges of the plates and the upper flanges of the beams were joined by continuous, open, square butt welds extending the entire length of the beams. The outer plates were fastened to the outer beams by 6 by ⅜-inch intermittent fillet welds between both edges of the flanges and the under side of the plates. The spaces on one side of the beam were opposite the welds on the other side; thus the total length of these welds on each outer beam was approximately equal to the length of the beam.

The I-beams of the floor were supported at their ends on angles bolted to the restraining frame, which was made up of 30-inch 240-pound per foot steel I-beams reinforced by 6 by ⅝-inch diaphragms. There was clearance between the edges of the outer floor plates and the sides of the frame. The end connection of the floor beams to the restraining frame was as shown in Fig. 4. The completed floor ready for test is shown in Fig. 1.

For the purposes of computation the floor was considered as consisting of beam elements, one of which is shown in Fig. 5. They are T-sections having a very wide upper flange. The nominal properties of this beam element are as follows:

Depth of I-beam, in.	4.0
Weight of I-beam, lbs. per ft.	7.7
Thickness of plate, in.	0.25
Weight of plate and weld, lbs. per linear ft.	20.4
Total weight of beam, plate and weld, lbs. per linear ft.	28.1
Average weight of floor, lbs. per sq. ft.	14.05
Cross-sectional area (1 beam and 1 plate 24 in. wide), sq. in.	8.21
Distance of centroidal axis of floor from bottom of beam, in.	3.553
Moment of inertia of cross section of floor about centroidal axis (1 beam and 1 plate 24 in wide), $in.^4$	13.32
Section modulus of floor (1 beam and 1 plate 24 in. wide), $in.^3$	3.75

A. S. T. M. tensile specimens cut from the I-beams showed the following mechanical properties.

	Yield Point lbs. per sq. in.	Tensile Strength lbs. per sq. in.	Modulus of Elasticity lbs. per sq. in.	Elong. in 8 in. %
Flange	33,600	58,900	30,000,000	27.3
Flange	33,700	58,500	30,600,000	27.0
Web	28,900	60,000	29,400,000	28.8

In loading, seven equal areas marked R to X, as shown in Fig. 3, were laid off above each beam by lines drawn midway between the beams and at equal intervals across the beams. The floor was loaded with equal weights of pig iron on each area except the three central areas, U, shown shaded in Fig. 3. The center of gravity of the load on each area was approximately over the centroid of the area except that pigs were not piled on the portion of the plate overhanging the outer beams.

Strain gage and deflection readings were taken for nominal loads of 40, 80, 100, 120, 140, 160, 180 and 200

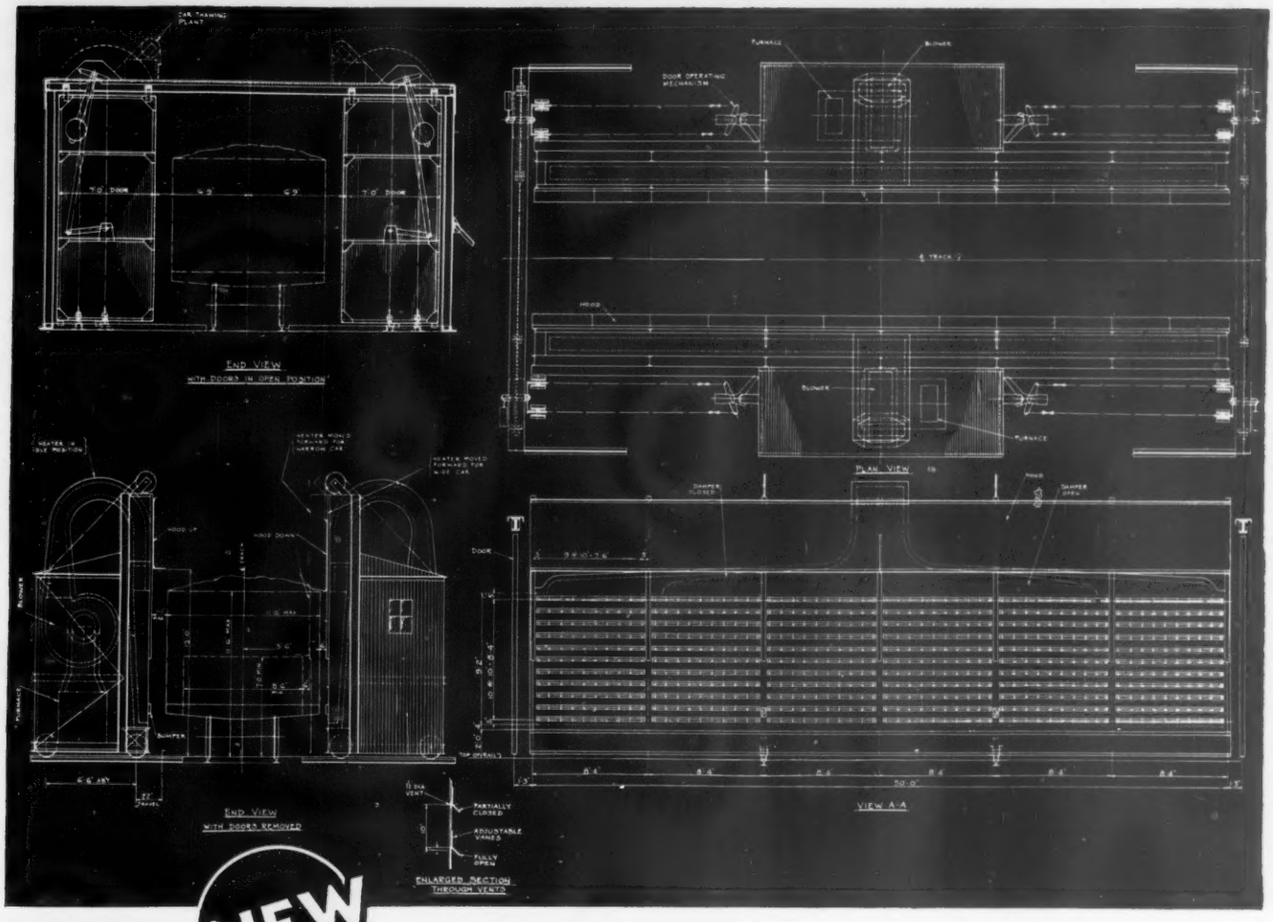
Test Confirms Allowable Load Tables of Institute

THE accompanying report of the load test of a section of battledeck floor is abstracted from Research Paper RP662, issued by the bureau of standards, United States department of commerce. The report, which is by L. B. Tuckerman, A. H. Stang and W. R. Osgood, covers part of a program of investigation on this type of floor, in which the bureau is co-operating with the American Institute of Steel Construction Inc. In the load test described herein, the institute was represented by F. H. Frankland, its director of engineering service.

The results of the test indicate that the allowable load tables for battledeck floors published by the institute are in close agreement with the findings of the bureau.

—THE EDITORS

PREPARE FOR COLD WEATHER



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pounds per square foot. After the load of 40 pounds per square foot had been applied over the entire floor, the load on area U above beams Nos. 3, 4 and 5 was not increased when greater loads were applied to the remainder of the floor. This allowed strain gage readings to be taken on the upper surface of the floor. For loads greater than 200 pounds per square foot when no readings were taken the loads were again applied uniformly to the entire floor. The floor, under a nominal load of 420 pounds per square foot, is shown in Fig. 2.

The floor would have carried a greater load but it was considered inadvisable to increase the load because the frame—a permanent part of the fire resistance chamber—had deformed considerably. The deflection of the test floor at midspan under this load of 420 pounds per square foot was 3⅞ inches. This load remained on the floor for 5½ days. After the load was removed the permanent deflection at midspan was 2¾ inches.

Gage lines, all parallel to the beams, were placed adjacent to the ends and at the mid-span of beams Nos. 3, 4 and 5. Lines A, B and C were as shown in Fig. 5; D was on the upper surface of the plate about ¼ inch from the edge of the weld. Four additional 2-inch gage lines were laid off on the lower flange of beam No. 4, spaced at 12 inch intervals from the end of the beam. At mid-span seven 10-inch gage lines were laid off longitudinally on the upper surface of the floor between beams Nos. 4 and 5. These lines were spaced about 4 inches apart.

The stresses obtained from the strain gage readings were called "measured stresses" to distinguish them from the stresses computed from the dimensions of the floor, the loads, etc., which were called "computed stresses."

The strain (inches per inch) in the floor, caused by change in the loading, was obtained by dividing the difference in the strain gage readings by the gage length. The measured stress was obtained by multiplying the strain by the Young's modulus of elasticity. The average modulus, 30,000,000 pounds per square inch, found for the beams was used.

Deflections of beams Nos. 1, 2, 3, and 4 were measured by a wire stretched between points on the web of the beam about ¾-inch above the lower flange and about 1 inch from each end. A mirror having a scale was attached to the web at midspan behind the wire. The scale was graduated in tenths of an inch and the deflection estimated to the nearest 0.01 inch.

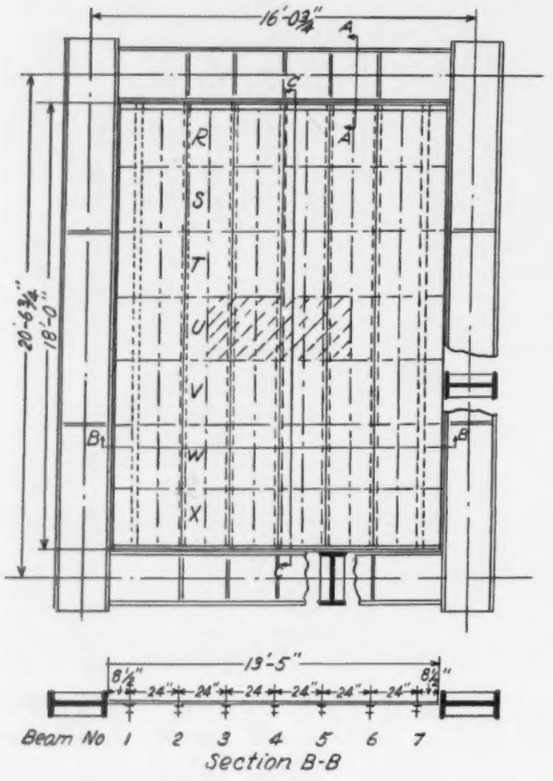


Fig. 3—Arrangement of battledeck floor and restraining frame. The seven 4-inch beams are fastened to the frame at their ends, but there is clearance between the overhanging plates and the frame at the sides. Thus the test floor has a clear span of 18 feet. The letters refer to marked off sections employed in placing the load

Results of Load Test

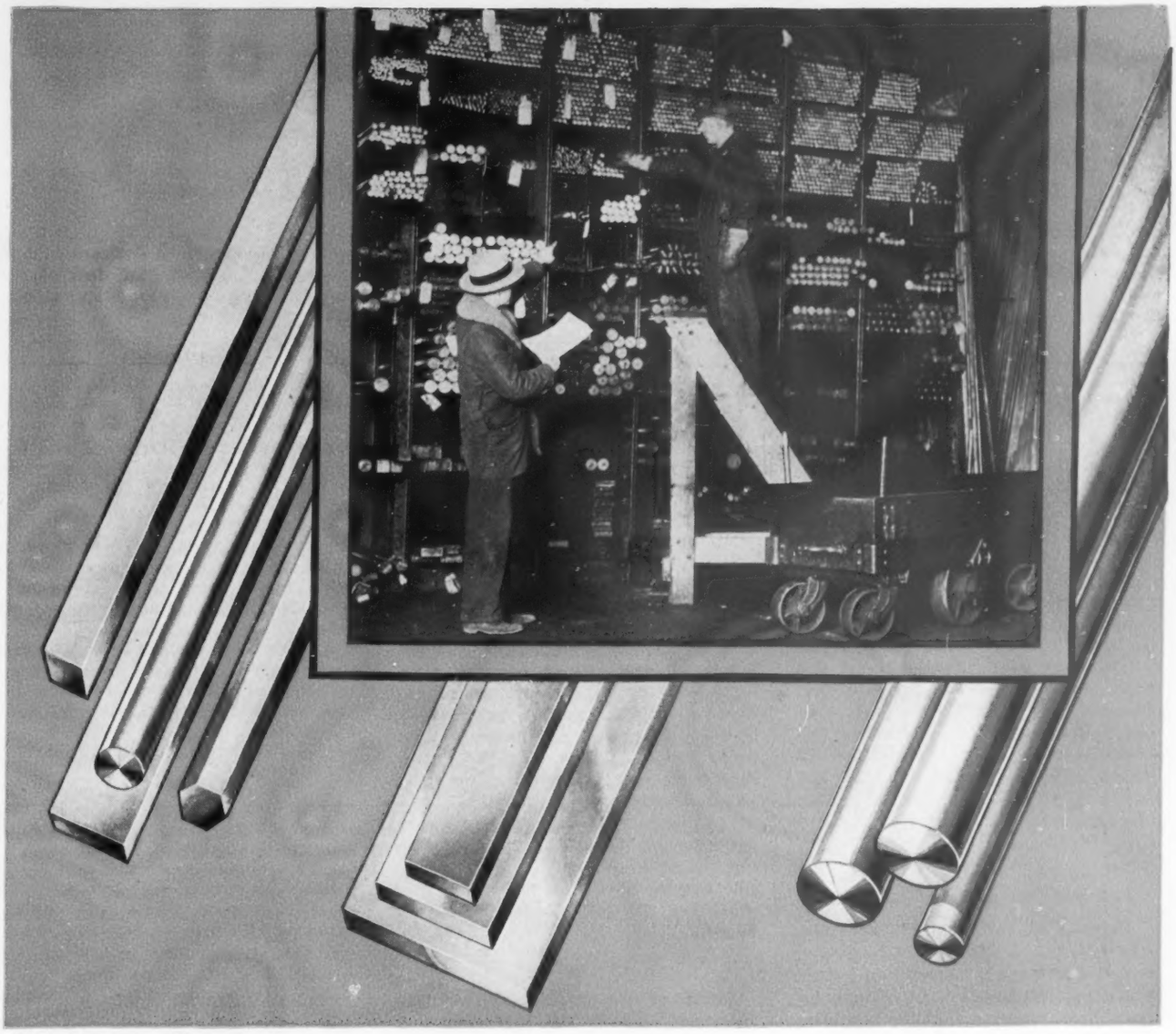
The strength and the deflection of a steel plate floor depend upon many things, one of the most important of which is the condition at the ends. In order to simulate the end condition of a floor which is continuous over the supports, the ends of this floor were secured to the frame. The frame, therefore, exerted a negative bending moment on the ends of the floor. Because measuring the negative moment presented unusual difficulties, it was decided to determine the point of zero stress in the lower surface of the middle beam from the strain gage readings on gage lines on the lower flange of beam No. 4 with the expectation that this determination, with the other data, would be sufficient to allow the stresses and deflections for the middle beam element to be computed, and that the stresses and deflections in the other beam elements would be approximately the same.

Course of Zero Stress Plotted

The distance from midspan of the beam was plotted as abscissa and the measured stress as ordinate, and then a faired curve drawn among the points. The point of zero stress was taken where the curve crossed the axis and its distance from midspan of the floor determined. The resultant course of the point of zero stress, the measured stresses at midspan in gage line A (See Fig. 5) in the bottom flange of beam No. 4 and the measured deflection of beam No. 4 at midspan were approximately as follows:

Nominal load, lbs. per sq. in.	Zero point of stress, in. from midspan (measured)	Measured stress, lbs. per sq. in.	Measured deflection at midspan inches
40	80.0	5,000	0.18
80	85.0	9,900	0.39
100	85.5	11,500	0.48
120	86.0	14,500	0.54
140	86.5	17,000	0.64
160	86.5	17,500	0.69
180	87.0	18,500	0.79
200	87.0	21,000	0.89

Assuming that there were only vertical forces and negative moments on the ends of the floor it was found that the computed values of the stress on the bottom of beam No. 4 at midspan and of the deflection did not agree with the measured values. Further study led to the belief that the frame might also have exerted tensile forces on the floor. For the middle beam element, assuming that the entire width of the plate (24 inches) was effective, values of the tensile force and the negative moment were found which gave computed values of the stress, the deflection, and the point of zero stress on the lower flange agreeing with the measured values within the errors of observation. These values of the tensile force and the negative moment for each 2-foot width of floor were 7100 pound and 20,000 pound inches, respectively, for a load of 40 pounds per square foot and 12,700 pound and 62,700 pound inches, respectively, for a load of 200 pounds per square foot. For intermediate loads the values varied linearly. The



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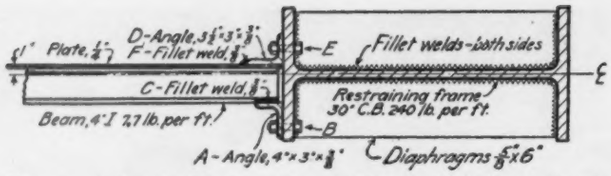


Fig. 4—A longitudinal section at the end of floor showing connection of beams to restraining frame

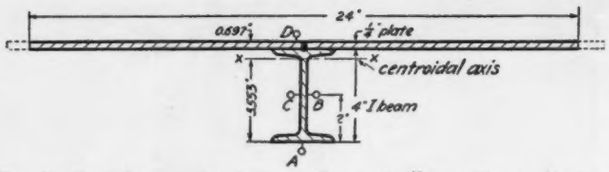


Fig. 5—One beam element of the test floor, the unit employed in making computations

computed values for the location of the point of zero stress, for the tensile stress and deflection at midspan are as follows:

Nominal load, lbs. per sq. in.	Zero point of stress, in. from midspan (computed)	Computed stress, lbs. per sq. in.	Computed deflection at midspan inches
40	80.0	5,700	0.18
80	84.5	10,000	0.36
100	85.2	12,150	0.45
120	86.2	14,300	0.54
140	86.5	16,450	0.63
160	86.7	18,600	0.72
180	86.8	20,750	0.81
200	86.9	22,900	0.90

Due to the tensile forces the point of zero stress on the bottom flange of the beam does not occur at the same section as the point of inflection. Although the ends of the floor were restrained, the negative moment did not "fix" the ends, i.e., cause the centroidal surface of the beam element to be horizontal at the frame. The computed slope at the ends ranged from 0.0013 for a load of 40 pounds per square foot to 0.010 for a load of 200 pounds per square foot.

Stresses Measured, Computed

Stresses at the ends of beam elements Nos. 3, 4 and 5 were measured and the stresses for beam No. 4 were computed. The measured values for gage lines below the plates are consistent within the error of the strain-gage readings but are greater than the computed values for beam No. 4. Those for A on the bottom flange of the beam are greater than the computed values, probably because the lower flange was welded to the frame near these gage lines.

The measured values of the stresses in the upper surface of the plate are erratic, probably because these gage lines were on the top of the plates and it was impossible to keep the gage holes clear although they were cleaned frequently.

In making computations, it was assumed that the full width of the plates was effective in carrying the load. The results of the computation gave no indication that this assumption was not justified, nor was there any unquestionable experimental evidence to support the assumption. Karman* indicates, however, that under conditions not unlike those of the test floor, with the exception that the beams are spaced at infinite distances instead of 24 inches, an effective width of about 40 inches may be expected unless the plate is so thin that it will buckle (no buckling was observed in the plates of the test floor). It may be noted that if the effective width were only 9 inches instead of the full 24 inches, the section modulus, and thus the strength would be reduced only 5 per cent. However, the moment of inertia of the cross section would be reduced almost 20 per cent, which would increase materially the calculated deflections.

Longitudinal stresses in the plate between beams Nos. 4 and 5 were measured and values for the gage lines over the beams were computed. The values were erratic, presumably due to difficulty in maintaining clean gage holes. Those for D6 were especially unsatisfactory. The measured stresses for the nominal load of 180 pounds per square foot were for all gage lines greater than those for the nominal load of 200 pounds per square foot. No reasonable explanation of this inconsistency was found.

Assumptions

None of the results obtained on this steel plate floor indicates that the assumptions (a) and (b) are not justified. The floor behaves as a unit when loads are applied. There was no visible evidence that the welds joining the beams and plates were either ruptured or permanently deformed. The measured stresses do not indicate that the strength of the welds joining the beams and plates was insufficient to cause the floor to behave as a unit.

There is no indication that the axis of average stress in the floor does not coincide with the horizontal line through the centroid of the cross section of the floor.

The measured stresses and the measured deflections of the floor under load agree within the errors of observation with the computed values, when the moment of inertia and the section modulus were obtained from the nominal dimensions.

The results of this test indicate that for ordinary spans, if the spacing of the beams does not exceed 100 times the thickness of the plates, the full width of the plates may be considered effective and the methods used by engineers in designing steel beams may be used with satisfactory results when designing battledeck floors.

Conclusions

1. The continuous manual welds joining the plates to the I-beams made by using bare metallic electrodes (5/32-inch diameter) and the direct-current arc-welding process united the plates and the beams so that they behaved as a unit when loads were applied.

2. The measured stresses and the measured deflections were in substantial agreement with values computed by the ordinary theory of beams.

3. This floor carried a load of 420 pounds per square foot for 5½ days without any indication of collapse. The deflection under this load was 3⅞ inches. After the load was removed the permanent deflection was 2¾ inches.

4. The results of this test gave no positive indications as to the width of the plate which may be considered effective. There is a strong presumption, however, that under conditions of loading and length of span not totally unlike those of the test an effective width up to 24 inches may be assumed in designing with ¼-inch plate.

*Die mittragende Breite, Beitrage zur technischen Mechanik und technischen Physik, p. 114, Julius Springer, Berlin, 1924.

Buys Electrodes on Basis Of Performance Rating

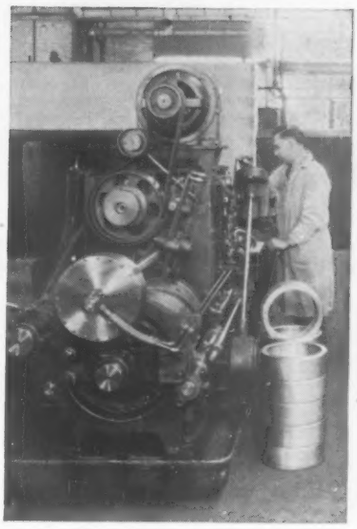
As recently stated in STEEL, the bureau of supplies and accounts, navy department, now is buying welding electrodes in accordance with their performance value. The department obtains samples from electrode manufacturers and then it gives them a performance value or merit number, after which the manufacturer has to furnish rods of equal quality. The performance value is derived by this formula:

$$\text{Performance value} = \text{t. s.} \times \text{elongation} \times \frac{A}{B} \times A \times C \times 10^7$$

where

t. s. = tensile strength in lbs. per sq. in.
elongation = elongation in per cent.
$\frac{A}{B}$ = deposition efficiency computed on the basis of 100 lbs. less per cent sputter loss.
A = rate of deposition in oz. per hr.
C = a constant equal to 1 for ⅛-inch and smaller, ¾ for 5/32-inch, ½ for 3/16-inch, and 3/10 for ¼-inch electrodes.

Making the Most *of* METHODS AND MATERIALS



Hot Shearing Knives Forged From Special Alloy Steel

Nickel - chromium - molybdenum steels are finding favor for hot shearing knives. Various compositions are used with carbon from 0.35 to 0.60, nickel 1.00 to 2.75, chromium 0.60 to 0.75 and molybdenum 0.30 to 1.00 per cent. The following composition is recommended as one of the best: Carbon 0.40-0.50, manganese 0.50-0.80, nickel 1.50-2.00, chromium 0.70-0.90 and molybdenum 0.20-0.30 per cent. After forging this steel should be annealed by heating to 1550 degrees Fahr. and cooling in the furnace, followed by a reheating to 1250 to 1300 degrees, holding for 4 or 5 hours at this temperature, and furnace cooling. This should place it in a readily machinable condition. If no forging is required, the steel can be purchased from the mill in the annealed state. For hardening, the steel should be heated to 1475 to 1525 degrees Fahr., held 1 hour per inch of section and oil quenched. It should then be immediately drawn to a brinell hardness of about 450. This ordinarily requires a tempering temperature of about 800 degrees Fahr.

$ $ $

Drawing Headlamp Ring

One automobile manufacturer making its headlamps from rustless steel produces the door of the lamp by butt welding a strip into a hoop. The flash then is sheared off and the hoop formed into a door ring in a series of drawing operations. The most interesting of these is producing the barrel contour in an expanding press. In this press a disk of rubber is used, which by compression takes a barrel shape and forces the steel out to the die. The company makes its own rubber pads under careful control as to hardness and strength. In production, they last 3 or 4 days.

$ $ $

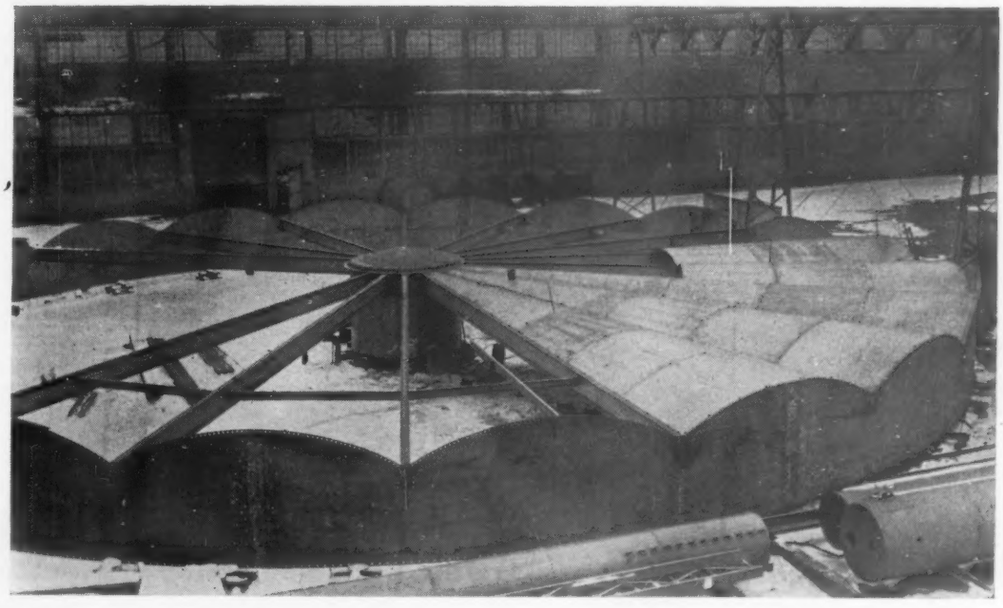
Spray Insulating Material

Designers of automobiles, machinery and other equipment, are exhibiting considerable interest in the development of a new sound absorbing and insulating material. It has an asphalt base in which a soft filler is incorporated. Supplied in liquid form, the material can be applied with spray gun equipment. Temperatures within the range of 30 degrees below zero to 250 degrees Fahr. are said to have no effect on it.

$ $ $

Heat Treated Cast Iron Used In Manhole Covers

A very interesting application of heat-treated cast iron is for street manhole covers. For this application, a material of low yield point is not suitable since it permits the cover to bend after which it rattles in its frame as traffic passes over it. When made from gray cast iron the breakage is high particularly in winter when due to the snow melting off the covers they are often several inches lower than the level of the



SOMETHING NEW IN OIL TANKS: Construction work in progress on a radial cone tank, at the Greeenville, Pa., plant of the Chicago Bridge & Iron Works. The structure is 100 feet in diameter, 43 feet high, and will be installed in the Talara, Peru, plant of the International Petroleum Co. Ltd. Roof section plates present a conical surface, supported on radial girders. The tank bottom is similar in construction, with the cone plates in reverse position. Photo courtesy National Petroleum News

THE PICKLING TANK *is already Triflex-lined*

WHEN Inland Steel Company engineers faced the problem of having a new strip pickling unit constructed, their thought was not confined to provision for immediate contingencies. They projected their planning into future years and set out to build *the pickling tank of tomorrow.*

Their new 240-foot unit is comprised of 4 tanks, each 60 feet in length, 7 feet wide and about 5 feet deep. No excavation was necessary since all tanks rest on concrete piers at floor level. Equipped with sumps in the end for proper drainage, the tanks are emptied by 6-inch lead siphons operated with cold water. When a tank is covered and ventilated, one may stand right beside it, never realizing that pickling is in progress, never inhaling unhealthful fumes. In providing pickling facilities, Inland Steel Company engineers scientifically surveyed the issues of capital expenditure, operating expense, maintenance expense and working conditions. And just as scientifically did Goodrich meet every issue.

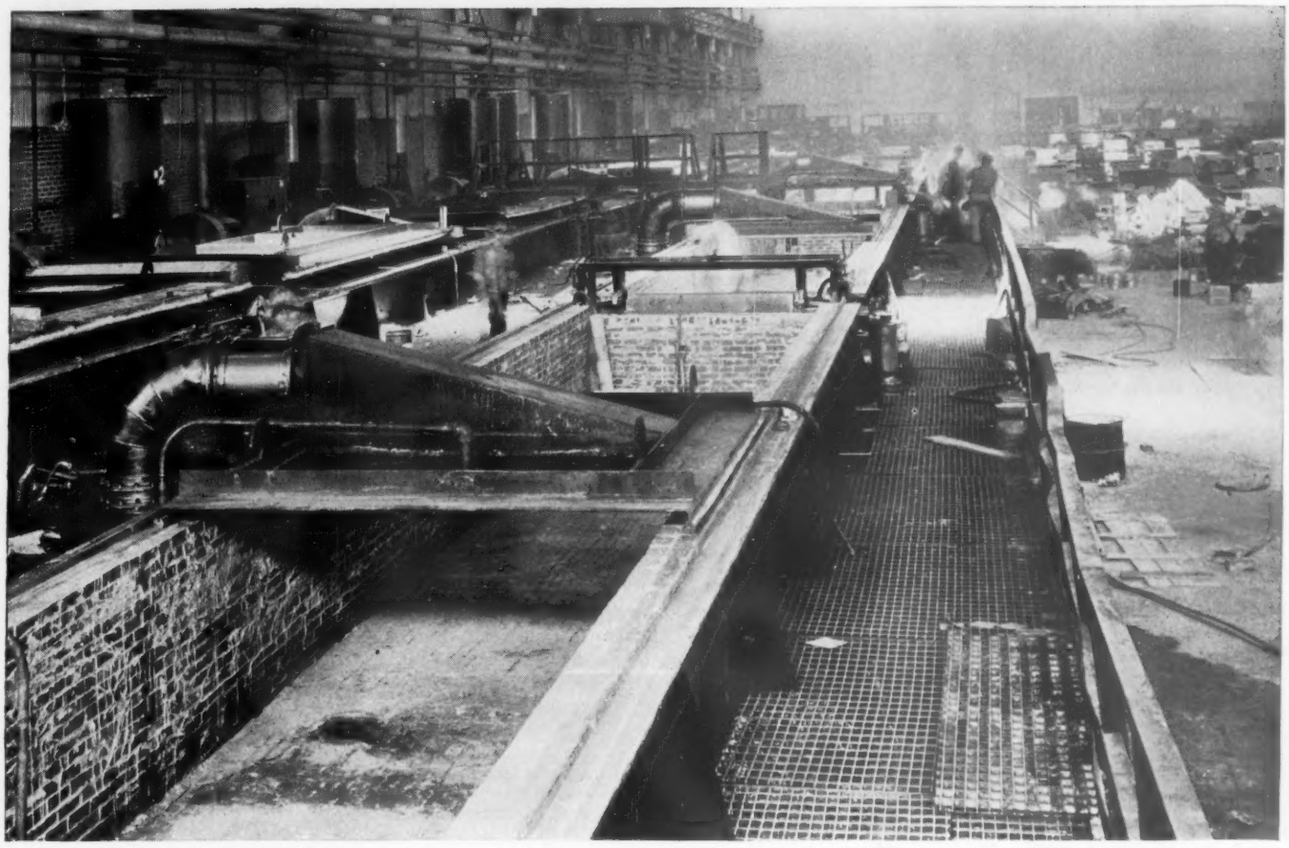
Goodrich is proud of Inland's pickling tank of tomorrow. For the entire unit *is in service today,* lined with ¼-inch Goodrich Triflex Rubber and sheathed with 8-inch brick laid up with Vitrobond. Ventilation is preserved through the use of rubber-lined pipe and rubber-lined fans. On every feature involving rubber lining, Goodrich engineers worked hand in hand with Inland officials.

Goodrich participation in this instance is typical of the service offered by a staff of Goodrich Research Engineers. They stand ready to work out for you those pickling problems of leakage, corrosion, abrasion, replacements and high maintenance expense. Let them explain—

● *Triflex-lined, Vulcalock Steel Pickling Tank. Brick sheathing was installed in this tank before it was placed in actual service. Note the Triflex expansion joints.*

Goodrich

OF TOMORROW • • •



● *The new strip pickling unit of the Inland Steel Co., Indiana Harbor, Ind.*

1) How Triflex, with its layer of hard rubber sandwiched between two layers of soft rubber resists corrosion and abrasion.

2) How Triflex, applied by the exclusive Goodrich Vulcalock Process, insures adhesion of 700 to 1000 pounds per square inch between rubber and steel.

3) How Triflex expansion joints, properly spaced in the rubber lining, prevent buckling and cracking under extremes of temperatures.

4) How brick sheathing, laid up with a special mortar, may be combined with Triflex, to give greater insulation in high temperatures and added protection against gouging. And how expansion joints, applied in the brick itself, give permanence to the whole installation.

Whatever your peculiar problems may be, Goodrich engineers will be glad to analyze them with you and to make specific recommendations. Complete designing and installation service is provided at no extra cost. The B. F. Goodrich Rubber Company, Mechanical Rubber Goods Division, Akron, Ohio.

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Rubber Lining for Pickling, Plating and Storage Tanks, Tank Cars, Pipe and Valves...Conveyor, Elevator and Transmission Belting . . . Acid, Air, Steam, Suction and Fire Hose . . . Hard Rubber Goods . . . Packing . . . Molded Rubber Products . . . . and a Complete Line of Miscellaneous Rubber Items.

Rubber Lining

ALL *products problems* IN RUBBER

surrounding snow and ice. When a heavy truck wheel drops from the snow to the cover the severe impact frequently is sufficient to cause failure. These gray iron covers are heavy, weighing 212 pounds, and hard to handle. A heat treated cast iron was designed for the job and the weight of the casting reduced to 172 pounds. This material has a high yield point—50,000 pounds per square inch—and possesses good impact resistance.

$ $ $

Chemical Rustproofs Metals

A rust-resisting, paint-receptive foundation is said to be applied to zinc die castings and electrogalvanized or cadmium plated steel by a simple immersion for 10 to 25 seconds in a recently developed chemical solution. No electric current is required. One gallon of the chemical is understood to be sufficient to coat about 2000 square feet of metal surface. A steel tank is used, the temperature of the bath being maintained between 160 and 180 degrees Fahr. The work must be chemically cleaned prior to immersion and preferably brushed if a very smooth coating is desired. After coating, the work is rinsed thoroughly in cold running water, followed by a hot rinse to dry. The work should be tack-ragged before applying paint or enamel.

New High-Speed Cutting Tools May Revolutionize Plant Expansion

BY PHILIP E. BLISS
President, Warner & Swasey Co., Cleveland

IN THE old days an increase in a manufacturer's business usually meant a corresponding increase in plant floor space and plant equipment. Thus, in order to handle twice as much volume, a company might often use twice as much space and practically double the number of machine tools and other appliances in operation.

With the advent of the depression, a large share of such equipment and plant space became idle. Certain maintenance and upkeep charges, however, inevitably continued. Building repairs, painting, insurance, taxes, guarding, lighting and the like went right on. Excess unused plant capacity, therefore, became a very heavy burden upon industry at a time when industry could least afford it.

At the present time, with the turn of the business pendulum, we now appear to be entering once more upon a period of increasing production, which brings again to the fore the problem of how best to accomplish expansion of facilities to meet increased demands. It is in this connection that new high-speed cutting tools are of the utmost significance.

During the last few years new cutting materials have been perfected and adapted to practical use in metalworking machines of sturdier, but not larger, build, and of much higher speeds than were formerly the case.

To be specific—with the new cemented tungsten carbide tools, a turret lathe of the same size as one built 10 years ago now is capable of removing twice as many cubic inches of metal in the same period of time. This machine takes up the same amount of floor space as one of the old type, and yet it does double the amount of work and doubles the productivity of the man who operates it. In addition, improvements in design give a machine of this type a greater range of feeds and broader adaptation to various types of work.

The most significant result of such advances made during depression years in metalworking machinery is that it is no longer possible to measure plant capacity in square feet. It must be measured, instead, in productivity per machine.

New Means to Boost Output

At the present time a factory faced with the problem of doubling its output may, therefore, adopt a plan quite different from that of 10 years ago. Instead of doubling its floor space and equipment, it may keep its present floor space and replace its present metalworking equipment with machines of twice the speed and twice the productivity.

The advantages of this procedure are obvious. Man power remains the same. Building maintenance charges, lighting, heat, taxes, insurance and so forth remain practically the same. Electric power consumption is increased, but this is only one item. Yet plant productivity has been greatly increased. By this method a company is able to accomplish plant expansion without involving itself in additional floor space and overhead which, in turn, may become a difficult burden in times of recession.

The result may be a new trend in factory building and factory rehabilitation—a trend in which compactness of operations and maximum productivity per unit of space may be the outstanding characteristics.

$ $ $

Bronze Welding Salvages Broken Press Frame

A cast-iron brick press frame developed a fracture 3 feet long. To replace the frame would have cost about $1000. Instead the break was chipped out on both sides and ground. A ½-inch hole was drilled at the end of the crack to prevent it from spreading. Two welders, one on either side of the frame, after locally preheating the area slightly with the welding blowpipe, applied 25 pounds of bronze over the break. This involved over 24 inches of horizontal welding and 12 inches of overhead welding. To prevent damage to some bearings near enough to the heat zone, cold water was poured over them at frequent intervals. No machining was found necessary after the job cooled down. This job could not have been done in place by any other method, and the cost of repair was insignificant.

$ $ $

Die Cast Aluminum Bronze

A vacuum method for die casting aluminum bronze, whereby the metal is drawn from below the surface of the metal in the pot and is delivered to the die in a smooth, continuous flow, now is in use. Aluminum oxide formed on the surface of the metal is said to be deposited in a thin film on the walls of the die cavity, with no aluminum oxide in the interior of the casting.

$ $ $

After an experience in welding sand holes in the teeth of a large gear, which resulted in a considerable saving, a steel foundry in the East has made the oxyacetylene blowpipe a standard reclamation method in filling up sand holes and flaws.

$ $ $

Titanium additions have been made to malleable iron to remove sulphur and reduce oxygen. It is said to have a slight effect in raising physical values.

HIGH SPEED DRILLING DEMANDS Alloy Steel and Iron

VALVES, cylinders, pistons, chucks, rotating elements—practically every part of the modern high speed drill depends upon some special alloy for successful performance. Skillful use of alloying elements has resulted in the multiplied work power, longer life and lighter weight characteristic of these parts—and in lower cost per foot of hole.

Throughout industry this trend toward Alloy Steel and Iron is well defined. The superior physical properties of these metals are being utilized wherever operating conditions demand increased tensile strength, lighter weight or greater resistance to abrasion, impact, acids, corrosion, distortion or fatigue.

Alloy Steel and Iron assures minimum interruption of operations for repairs. It should be carefully considered for any part that wears out or breaks before the equipment itself becomes obsolete. Electromet engineers will gladly explain how these results may be obtained by the use of Ferro-Alloys in Alloy Steel and Iron.

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Electromet Ferro-Alloys & Metals

Selecting the Right Steels For Heat Treated Gears

BY T. R. RIDEOUT
Nuttall Works, Westinghouse Electric & Mfg. Co.

THE day of the soft steel gear for industrial applications is passing. The adoption of heat treated gearing has become necessary to meet the demands of increasing loads and speeds and the economic requirement of longer life.

But what steel and what treatment to use? This is the unbelievably complicated problem in a gear jobbing shop, manufacturing diversified gearing products. Each application or order presents an entirely different combination of service requirements which must be met. There are innumerable combinations of different steels and treatments available. Contrary to some claims, there is no one steel or treatment suitable for all applications.

The qualities which a steel should possess, in order to successfully meet the various service demands and manufacturing requirements, listed in the order of their importance, are as follows:

1. Ability to withstand wear.
2. Strength.
3. Static toughness.
4. Impact toughness.
5. Low amount of distortion.
6. Ease of machinability.
7. Susceptibility to and ease of heat treatment.

Match Steel to Needs

These qualities must be determined, or rather judged, from the known properties or characteristics of the steel which have been determined by test, or from previous experience.

Having decided upon the desired qualities which the gear must possess and the characteristics necessary to fulfill these qualities, the engineer must select a steel and heat treatment that possess in the greatest number and highest degree the necessary characteristics.

Gear steels may be divided into the plain carbon and the alloy steels. Alloy steels are used to some extent in the industrial field but heat treated plain carbon steels are far more common.

The use of untreated alloy steels for gears is seldom, if ever, justified and then, only when heat treating facilities are lacking. It is true that the strength and toughness of normalized alloy steels are somewhat greater than for an untreated, plain carbon steel of the same carbon content but, in the author's opinion, the higher values of those properties alone do not justify the additional cost, and in no case will an untreated or normalized alloy steel be comparable with a heat treated, plain carbon steel.

Heat treated alloy steels have some advantages over heat treated plain carbon steels. Those advantages, while important, are not as numerous or as great as generally supposed. An important fact—not generally known—is that the ultimate strength of heat treated alloy steels is nearly identical to that of heat treated carbon steel of the same hardness.

The factors which determine whether to use heat treated plain carbon steels or heat treated alloy steels are thus: Does the service condition or design require the superior characteristics of the alloy steels, or, if alloy steels are not required, will the advantages to be derived offset the additional cost? For most applications, plain carbon steels, heat treated to obtain the best of their qualities for the service intended, are eminently satisfactory and quite economical.

The results of recent investigations and a study of existing data have convinced the author that the only advantages obtained from the use of heat treated alloy steels over that of heat treated plain carbon steels, are:

1. Increased surface hardness and depth of hardness penetration for the same carbon content and quench.
2. The ability to obtain the same surface hardness with a less drastic quench and, in the case of some of the alloys, a lower quenching temperature, thus giving less distortion.
3. The increased toughness as indicated by the higher values of yield point, elongation and reduction of area.
4. The finer grain size obtainable with the resulting higher impact toughness and increased wear resistance.
5. In the case of some of the alloys, better machining qualities or the possibility of machining at higher hardnesses.

Plain carbon and alloy steels each may be further subdivided into three classifications: Case hardening steels; full hardening steels, and steels that are heat treated and drawn to a hardness that will permit machining.

The first two—case hardening and full hardening steels—are interchangeable for some kinds of service, and the choice is often a matter of personal opinion. Case hardening steels with their extremely hard, fine grained (when properly treated) case, and comparatively soft and ductile core, are generally used when resistance to wear is desired. Case hardening alloy steels have a fairly tough core but not as tough as that of the full hardening steels.

Withstanding Shock Loads

There is considerable difference of opinion regarding the ability of the case hardened steels to withstand, successfully, shock loads. Due to the tendency of the extremely hard and brittle case to crack or spall under shock loads, the author's preference is for the full hardening steels for such applications.

In order to realize the greatest benefits from the core properties, case hardened steels should be double quenched. This is particularly true of the alloy steels because the benefits derived from their use seldom justifies the additional expense unless the core is refined and toughened by the second quench. The penalty that must be paid for the additional refinement is increased distortion, which may be excessive if the shape or design is not all that it might be.

Full hardening steels are used when great strength, high endurance limit, toughness, and resistance to shock, is required. The degree of these qualities is governed by the kind of steel and treatment used. Fairly high surface hardnesses are obtainable in this group, though not as high as those of the case harden-

Plain Carbon or Alloy Steels for Gears?

INFORMATION regarding the suitability of different steels and heat treatments for gearing is meager and conflicting. Tests have been made, but the reported results, due to the lack of a common "measuring stick," are hardly comparable.

In the accompanying article, which is abstracted from a paper presented at the eighteenth annual meeting of the American Gear Manufacturers' association, Wilkinsburg, Pa., May 4, 1934, the author cites seven important requirements of steels for gearing and discusses the extent to which various types of plain carbon and alloy steels meet these demands.

—THE EDITORS

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Bars, Bands and Special Sections

Carbon steel bars and bands, Bessemer and open-hearth; special and automotive sections of every description; iron bars, double refined; staybolt and engine bolt quality.

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Carbon billets and slabs, rerolling and forging quality; sheet bars and skelp.

Alloy Steels

Open-hearth and electric-furnace alloy steels for all purposes, hot-rolled and cold-drawn, rough-turned or ground; MAYARI nickel-chromium steels; MAYARI engine bolt and staybolt steels; RESILIA spring steel; SUPERTEMP, for superior physical properties at high temperatures. Bars, bands, billets and blooms.

Bolts and Nuts — Rivets — Spikes
Pole Line Material

Plain and galvanized bolts; machine, carriage, and special; heat-treated, carbon and alloy; MAYARI steel frog, track and fitting-up bolts; DARDELET self-locking threaded bolts and nuts; staybolts, solid and hollow; hot-forged and cold-punched nuts.

Pig Iron

Basic, Bessemer, foundry, low phosphorous, malleable, malleable Bessemer; MAYARI pig iron for making superior alloy iron castings.

Forgings

Carbon and alloy; hammered and hydraulically pressed; drop and upsetter; seamless vessels for oil refineries; high-pressure seamless boiler drums and chemical vessels.

Castings

Carbon and alloy steel (open-hearth and electric), manganese steel, iron, brass and bronze, rough as cast or machined; abrasion-resisting castings. Centrifugal cast bronze sleeves and liners; ingot moulds.

Wheels and Axles

Wrought steel wheels and axles for freight and passenger cars and engine, tender, and trailer trucks; for electric cars; for mine locomotives and mine cars; for cinder, ore and other industrial cars; crane wheels.

Rolled Steel Blanks

For gears, pinions, and flywheels. Tire moulds and mould rings, shaft couplings, brake wheels and drums, and other circular forgings.

Trackwork
for Steam, Electric, Mine and Industrial Railways

Frogs, switches, Bethlehem and NEW CENTURY switch stands, crossings, steel ties, gage rods, rail braces, BETHCO rail anchors; silico-manganese and manganese special trackwork; hook-flange guard rails, guard rail chairs, compromise joints.

Steel Freight and Passenger Cars

Mine Cars

Oil-Burning Equipment

BETHLEHEM-DAHL mechanical-atomizing oil-burning system for stationary and marine service.

Auxiliary Locomotives

Rails and Accessories

Standard tee, girder, girder-guard and high-tee rails; light rails; splice bars, rail clips, tie plates.

Steel Pipe

Butt-welded and lap-welded pipe, black and galvanized; copper-bearing pipe.

Boiler Tubes

Genuine old-fashioned knobbled charcoal iron tubes; double-pass steel tubes. Double-pass copper-bearing steel tubes.

Steel Sheets

Hot-rolled, hot-rolled annealed, cold-rolled, heavy cold-rolled sheets; furniture, heavy furniture, automobile sheets; tack plate; galvanized, flat and formed sheets; painted formed sheets; special-finish sheets. Sheets of BETH-CU-LOY (copper-bearing steel).

Tool Steels

Bethlehem special high-speed steel; carbon and alloy tool steels; cobalt magnet steel; hot-work tool steels; die steels; valve steels; rivet set and pneumatic chisel steels; special tool steels; tool steel billets, of all grades. Rock and mine drill steels, hollow and solid.

Tin Plate

Coke tin plate; black plates; galvanizing, enameling and lithographing stock.

Corrosion-Resisting Steels

BETHADUR and BETHALON, covering practically every requirement for corrosion-resisting steels.

Tools

Rivet sets, punches and dies; chisel blanks and chisels; hot and cold friction saws; steel stamps (letters and figures for hot and cold work); slitting shears, shear blades; special high speed tool holder bits; special tools.

Wire and Wire Products

Plain, bolt, screw, chain, extra-soft rivet and hard bright nail wire; bright processed, annealed, normalized heading and telephone wire; galvanized wire; wire rods; BETHANIZED (special zinc-coated) wire; clothes-line wire; soft-processed wire; stapling wire; border wire; APEX and INVINCIBLE spring wire; barbed wire; SILVER STAR bale ties. BETHLEHEM (CAMBRIA) field and poultry fence. Nails.

Steel Fence Posts

Posts for farm fencing; snow fence posts; highway sign posts.

Structural Shapes

Bethlehem wide-flange beams, girders, and H-columns; joists and stanchions; standard beams, channels and angles; car and shipbuilding shapes; standard and special T- and Z-bars.

Steel Plates

Universal and sheared plates, for all purposes; slabs.

Flanged Products

Tank heads, boiler heads, dome sheets, manheads, yokes, bolts and saddles; miscellaneous flanged plate work.

Concrete Reinforcing Bars

Bethlehem deformed bars of constant section, in standard rounds and squares.

Steel Sheet Piling

Bethlehem steel sheet piling for temporary work, as in cofferdams, and permanent work, as in retaining walls, cut-off walls, and jetties.

BETHLEHEM STEEL COMPANY BETHLEHEM STEEL **General Offices: BETHLEHEM, PA.**

District Offices: Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Milwaukee, New York, Philadelphia, Pittsburgh, St. Paul, St. Louis, Washington, Wilkes-Barre, York. *Pacific Coast Distributor:* Pacific Coast Steel Corp., San Francisco, Seattle, Los Angeles, Portland, Honolulu. *Export Distributor:* Bethlehem Steel Export Corp., New York.

ing steels. For that reason the resistance to wear is not as great as might be obtained, but when wear resistance combined with great strength and toughness is required, this type of steel is superior to the others.

Full hardening steels distort to some extent when hardened, the amount being dependent upon the steel and quench used. For that reason the use of full hardening steels is not suitable for high speed gearing where noise is a factor, or for gearing where accuracy is of paramount importance, unless, of course, grinding of the teeth is practicable.

The medium and high carbon percentages require an oil quench but a water quench may be necessary for the lower carbon contents in order to obtain the highest physical properties and hardness. The distortion, however, will be greater with the water quench.

When grinding of the teeth is not practicable and a high degree of accuracy is required, hardened steels may be drawn or tempered to a hardness that will permit the cutting of the teeth. This treatment gives a highly refined structure, great toughness, and, in spite of the low hardness, excellent wearing qualities. The lower strength is somewhat compensated for by the elimination of the increment loads due to the impacts which are caused by inaccuracies.

When steels which have a low degree of hardness penetration from surface to core, are treated in this manner, the design cannot be based on the physical properties corresponding to the hardness at the surface. Since the physical properties are determined by the hardness, the drop in hardness from surface to core, due to the low degree of hardness penetration, will give lower physicals at the root of the teeth where the stress is greatest.

The quenching media may be either oil, water or brine depending on the steel used or hardness penetration desired. The amount of distortion, of course, is immaterial because the machining is done after heat treating.

When it is deemed necessary to use a heat treated alloy steel in order to obtain superior characteristics on properties over those of heat treated plain carbon steels, the selection of the alloying element or elements to use, is difficult. Some of the elements have similar effects, some have overlapping qualities and others introduce quite detrimental conditions. Compromise is necessary but the choice, due to the overlapping qualities, is, to some extent, often a matter of personal opinion. For use in deciding on the particular kind of alloy steel some of the more important characteristics imparted by the different alloying elements are given briefly below. The comments apply only to heat treated steels for the same quench. The effect of the addition of the alloying elements, in the conventional amounts, to steels of a given carbon content is compared with a plain carbon steel of the same carbon content.

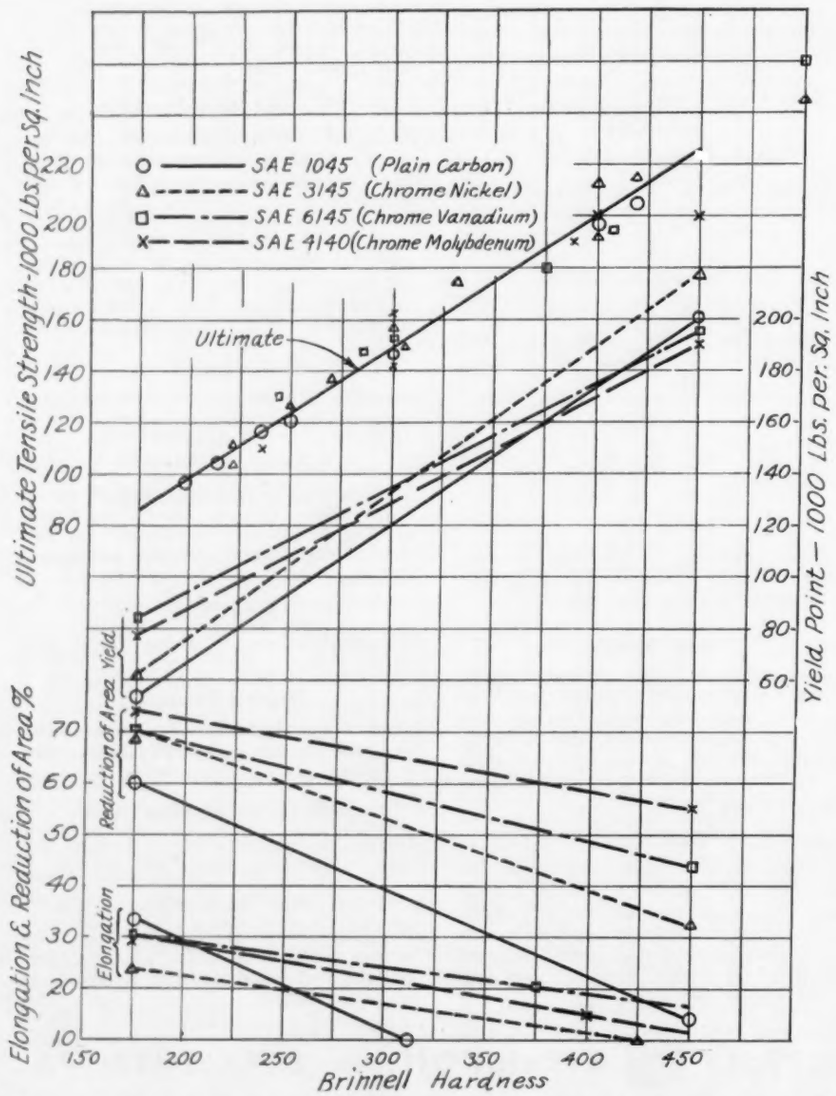


Fig. 1—Comparison of physical properties for four different steels, heat treated and drawn

Survey of Alloy Effects

Nickel—The addition of nickel tends to increase the hardness and strength with but little sacrifice in ductility. The hardness penetration is somewhat greater than that of the plain carbon steels. Its use as an alloying element lowers the critical points and therefore gives less distortion due to the lower quenching temperature. The nickel steels of the case hardening group carburize more slowly but the grain growth is less.

Chromium—Chromium increases the hardness and strength over that obtained by the use of nickel, though the loss of ductility is greater. Chromium refines the grain and imparts a greater depth hardness. Chromium steels have a high degree of wear resistance and are easily machined in spite of the fine grain.

Manganese—When present in sufficient amounts to warrant the use of the term alloy, the addition of manganese is very effective. It gives greater strength than the use of nickel and a higher degree of toughness than chromium. Due to its susceptibility to cold work, it is apt to flow under severe unit pressures. Up to the present time, it has never been used to any great extent for heat treated gears, but is now receiving an increasing amount of attention.

Vanadium—Vanadium has a similar effect to that of manganese, increasing the hardness, strength and toughness. The loss of ductility is somewhat more than that, due to

manganese, but the hardness penetration is greater than for any of the other alloying elements. Due to the extremely fine grained structure the impact strength is high. It has a disadvantage in that its presence tends to make machining difficult.

Molybdenum — Molybdenum has the property of increasing the strength without affecting the ductility. For the same hardness, steels containing molybdenum are more ductile than any other alloy steels and, having nearly the same strength are, therefore, tougher; in spite of the increased toughness the presence of molybdenum does not make machining more difficult. In fact, such steels can be machined at a higher hardness than any of the other alloys. The impact strength is nearly as great as that of the vanadium steels.

Chrome Nickel Steels—The combination of the two alloying elements combines the beneficial qualities of both. The high degree of ductility imparted by the nickel is complemented by the high strength, finer grain size, deep hardening and wear resistant properties imparted by the addition of the chromium. The increased toughness makes them somewhat more difficult to machine than the plain carbon steels and they are somewhat difficult to heat treat. The distortion increases with the amount of chrome and nickel.

Chrome Vanadium Steels—Chrome vanadium steels have practically the same tensile properties as the chrome nickel steels but the hardening power, impact strength and wear resistance are increased by the finer grain size. They are difficult to machine and distort more than the other alloy steels.

Chrome Molybdenum Steels—This group has the same qualities as the straight molybdenum steels but the hardening depth and wear resistance are increased by the addition of the chromium. This steel is very easily heat treated and machined.

Nickel Molybdenum Steels—Nickel molybdenum steels have qualities similar to the chrome molybdenum steels. The toughness is said to be greater although the steel is somewhat more difficult to machine.

Different Steels Compared

Two curves are presented to illustrate two of the most important points in the application of steel and heat treatments to gears. Fig. 1 shows the comparison of physical properties of four different steels. The values given are an average of all the figures that could be found and were obtained from tests, text books, various catalogs and handbooks. In the main, all the figures from the different sources agree quite closely, but when there are discrepancies, they are so extreme that the conclusion of error is obvious.

All the values found for the ultimate strength are shown in order to illustrate the fact that it is identical for a given hardness. It is surprising to note how closely the points agree. In order to avoid confusion, only the averages for values found for the other properties are given. Except in the case of the elongation for the SAE-1045 and SAE-4140, all the values given by the different authorities agree even more closely than they do for the ultimate strength. For those two steels, quite marked discrepancies were found for the elongation so values believed to be the more accurate were used.

Much can be learned by comparing different steels in a similar manner. For instance, a chart showing the various properties for different steels of the same carbon content plotted against drawing temperatures, or one comparing the properties for the different carbon contents plotted against the hardness, would be quite enlightening.

Fig. 2 shows the difference in hardness penetration for one steel and two different quenches and also for three different steels given the same quench and draw. By comparing the two charts the difference in the properties for the different hardnesses can easily be determined. A more detailed explanation has been previously given.

Little enough of the subject is known at present and most of that is in the hands of those not intimately connected with the actual applications. In conclusion it is hoped that this paper, in which only the surface could be touched, will indicate the need of further study of the subject and throw some light on how an engineer should approach that study.

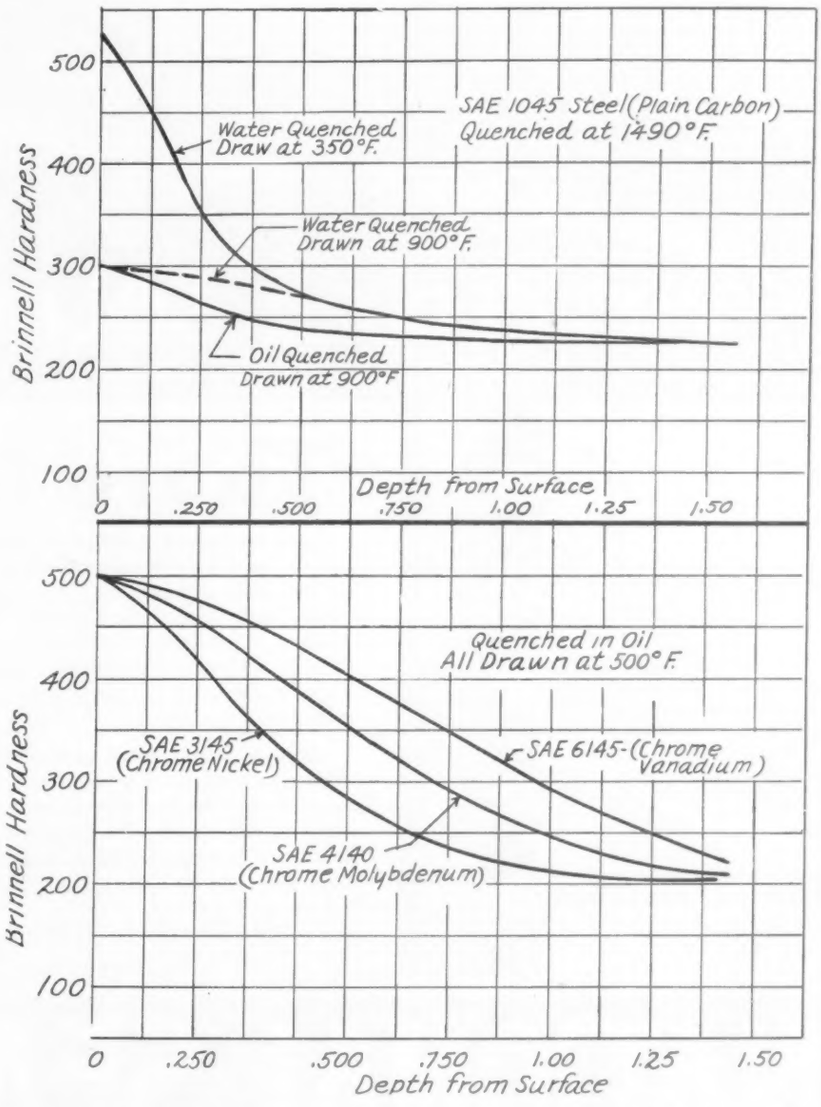
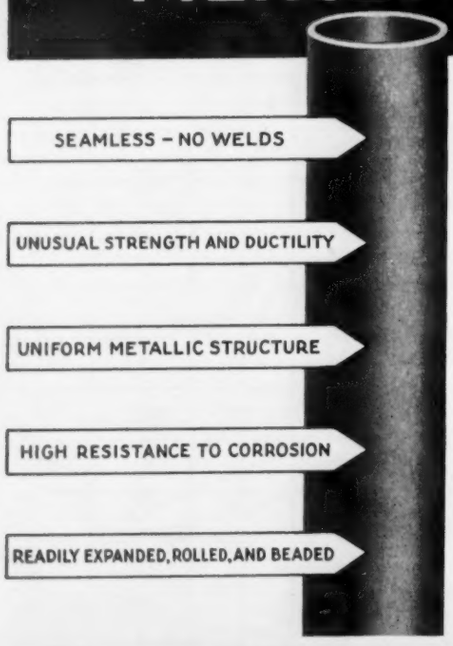


Fig. 2 (Above)—Difference in hardness penetration for different quenches. (Below) Difference in hardness penetration for different steels quenched in oil and drawn at 500 degrees Fahr.

BOILER TUBES at their best

PIERCED *from* SOLID STEEL!


SEAMLESS – NO WELDS
UNUSUAL STRENGTH AND DUCTILITY
UNIFORM METALLIC STRUCTURE
HIGH RESISTANCE TO CORROSION
READILY EXPANDED, ROLLED, AND BEADED

There is no weld

No weld—no long line of possible weakness. No chance, no dependence on the human element, no uncertainty of any kind need be allowed for, as affecting the uniform wall strength of a NATIONAL Seamless Boiler Tube. One continuous hollow cylinder, pierced from a solid billet, expanded and rolled at proper and definitely controlled temperatures to produce grain refinement and uniform transverse and longitudinal strength A balanced, homogeneous unit—unsurpassed from a manufacturing standpoint.

Likewise, from a service standpoint NATIONAL Seamless Boiler Tubes represent the ultimate of security. In countless railway, marine, and stationary boiler installations, they have proved reliable in every way under the most trying conditions. To get the advantage of the highest quality seamless boiler tubes, specify NATIONAL-SHELBY—

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BOILER TUBES—SAFE ENDS—SUPERHEATER TUBES—CONDENSER TUBING—ARCH TUBES—SUPERHEATER PIPES—STAY-BOLT MATERIAL

PROGRESS IN STEELMAKING

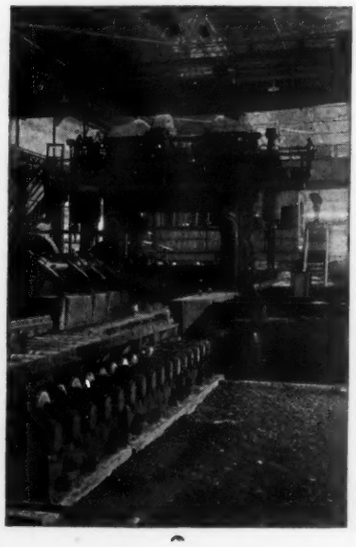
HEXAGON cold-drawn bars for nut stock now are being manufactured by a mill in the Pittsburgh district with one side imprinted with the letter "R" or "L" to designate right-hand or left-hand threads in the finished milled nuts.

♦ ♦ ♦

Zinc used in hot galvanizing baths should contain from 1 to 1.60 per cent lead and 0.08 per cent iron, according to practice followed by the British sheet galvanizing industry. Cadmium in small amounts sometimes is added to the bath, but this element tends to produce fine and small spangles. A bright metallic finish and good characteristic spangles are secured when the bath contains small quantities of aluminum and tin. Dull and brittle zinc coatings are caused by small quantities of antimony.

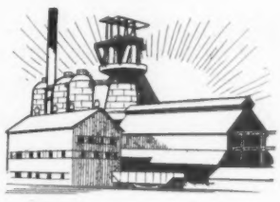
♦ ♦ ♦

Using 9 inches of insulating brick in a sheet mill pair furnace and finishing its surface with a high-temperature cement facing affords bringing the hearth to working temperature in four hours compared to 10 hours when conventional linings are used.



♦ ♦ ♦

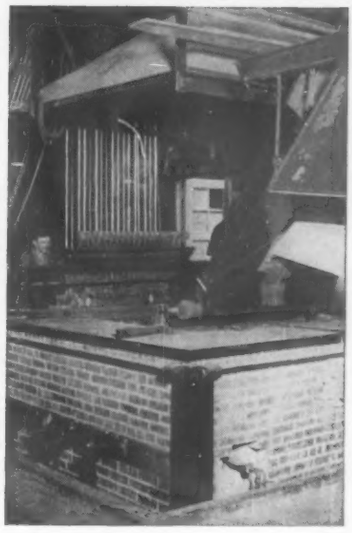
Subjecting hot rolled strip steel to a seven-roll breaking machine before pickling reduces the quantity of acid required for cleaning the surface and increases the production, according to tests conducted by a New England stripmaker.



HIGHER ratio of ore-to-coke in blast furnace burdens is possible when continuous blowing is practiced, according to an authority. Stopping the iron notch of a blast furnace without checking the wind is accomplished by the use of the automatic mud gun. This practice not only saves considerable time but promotes uniform operation by reason of the fact that the stock in the furnace is not permitted to pack tight as is the case when the blast is taken off to permit the tap hole to be plugged with the conventional-type clay gun.

♦ ♦ ♦

Removing scale from forgings now is accomplished by tumbling in a weak inhibited acid bath, followed by screening the abrasive material and spraying the work to remove all traces of acid. Forgings are charged by power-operated loading skip into a tumbling chamber which contains hardened stainless steel stars and steel grit. A 2 per cent cold acid solution is kept circulating over the work by a motor-driven pump. Scale on the forgings is loosened by the acid and removed by the action of the stars and abrasive material. Upon completion of the operation the work



is discharged into a conical screen which separates it from the abrasive material. The latter then is returned to the tumbling drum, the work continuing forward into a rotating washing drum. Here a hot basic cleaning liquid is sprayed on the work to remove and neutralize the acid sludge and the forgings are discharged into containers. Cleaning forgings by this method affords an increase in tumbling production, a decrease in the number of rejections and a higher surface finish.

♦ ♦ ♦

Chrome bonded sheets now are being produced in a new fluted design for show window backgrounds and display features. No difficulty is encountered in working the new product.

♦ ♦ ♦

Cold liming of wire rods and wire effects better results than hot liming the surface, according to an English authority. With the cold liming process the lime if spread uniformly, becomes firmly attached to the oxide on the surface of the steel and renders the work responsive to slip when undergoing plastic deformation. As a result of the latter advantage, the depth of reduction or number of passes is greater and, hence, drawing costs are more economical. Cold lime also retains its alkalinity far longer than hot liquor and, therefore, is more potent in neutralizing any acid carried over from the pickling tubs.

♦ ♦ ♦

Various 42-inch single-stand reversible mills in this country built for the production of thin-gage strip for tinning, have been designed for maximum rolling speeds ranging from 800 to 1200 feet per minute.

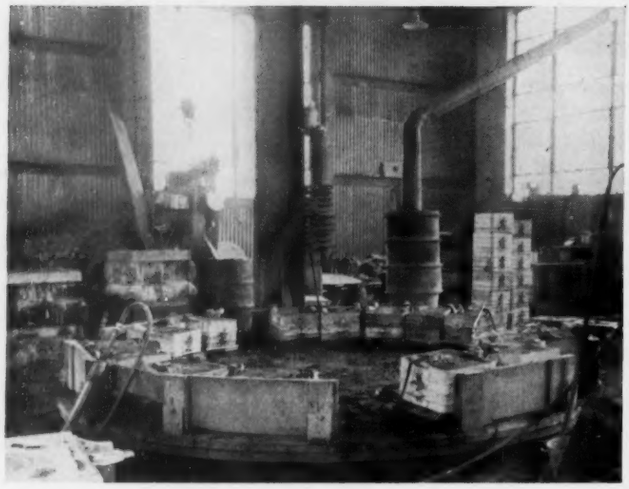


Fig. 1—Large centrifugal pouring table with molds in position for pouring. Fig. 2—Molds are poured, after which the table is rotated from 5 to 6 minutes

Spins Molds After Pouring Alloy Steel Castings

BY EDWIN BREMER

AN UNUSUAL feature in the foundry practice of the Duriron Co. Inc., Dayton, O., is the application of centrifugal force to obtain sound, dense, alloy castings. The foundry makes a wide variety of steel castings including such alloys as 18 per cent chromium, 8 per cent nickel; 18 per cent chromium, 9 per cent nickel with low carbon; 18 per cent chromium, 8 per cent nickel and 3 per cent molybdenum; 26 per cent chromium and 10 per cent nickel; and 20 per cent chromium, 23 per cent nickel, 1.25 per cent molybdenum, 1 per cent copper and 3 per cent silicon. The last named, called "Durimet," was developed by the Duriron company to withstand severe corrosion. The other four alloys are made under license from Krupp-Nirosta Inc. The foundry also produces a special iron alloy of about 14 per cent silicon, 4 per cent molybdenum and 1 per cent nickel. This iron is resistant to hydrochloric acid.

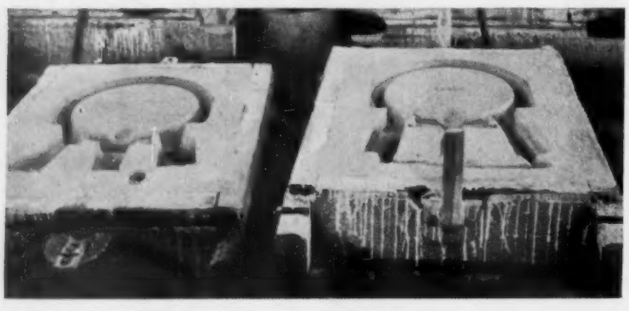
Molds for certain castings of these alloys are rotated. The method used has the same basic principle as employed in what is termed *centrifugal* casting, but the procedure of applying, or rather the time of applying centrifugal force is different. In centrifugal casting the molten metal is poured into a rapidly rotating mold revolving on a horizontal or vertical axis. In the process as applied at the Duriron Co. plant, the mold is stationary while it is being filled, and then it is rotated.

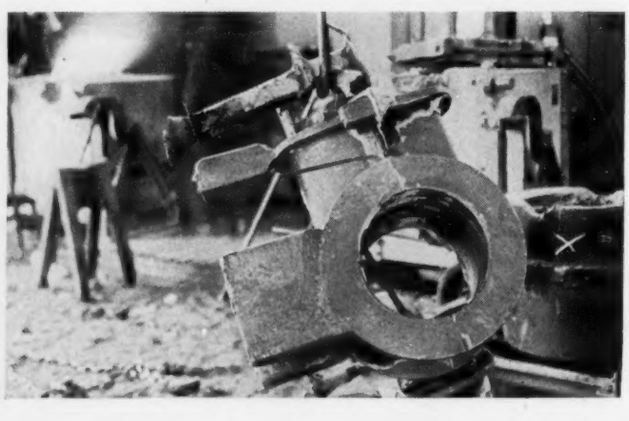
Figs. 1 and 2 are views of two rotable tables used in the operation which, by the way, is not employed on all types of castings. The tables are located in one of the end bays of the foundry opposite that containing the electric furnaces and cleaning department. One of the tables is about 12 feet in diameter and the other about 8 feet in diameter. They are mounted on central shafts and driven by electric motors. The speed of rotation is about 50 revolutions per minute, and the duration of rotation is from 5 to 6 minutes.

The molds are made on the floor in the usual manner and then placed on one of the tables. The manner of placement of the molds is important as may be judged readily. The gate sides of the molds are arranged so that they form the inner circle as may be observed in Fig. 2, while the portions of the molds containing the castings naturally, are located on the outer rim or edge of the table. Consequently, when the table is revolving, the centrifugal force generated throws the molten metal in the mold toward the points farthest from the center of rotation.

While some may question the efficacy of such treatment by suggesting that

Fig. 3 (Below)—Cope and drag molds for a disk for a gate valve just before closing. Fig. 4 (Right) Gate valve casting showing gate and risers





YOUR HOURS OF RECREATION OWE MUCH OF THEIR PLEASURE TO NICKEL

WORK gives plenty of jobs to Nickel. But so does PLAY.

Consider some of your favorite diversions. Through the aid of Nickel many of them are made far more pleasant and enjoyable.

For example take your radio. Every metal part of its screen grid tube is made of Nickel or contains Nickel as the principal ingredient. And the tone range would not be so broad nor the reception so sharp and clear were it not for Nickel. The laminated plates of the cores of the better radio transformers are made of an alloy high in Nickel.

Those color pictures you enjoy so much at the movies. They also owe much to alloys containing Nickel. For Nickel-bearing metal provides equipment that is rust-free, corrosion-free and highly resistant to chemical attacks... properties that are indispensable in the apparatus used for developing and transferring color films.

When you ride in your car, Nickel again comes to your aid. Strong, tough, hard alloys of Nickel contribute in various ways to its speed, safety, dependability and long life. Still other alloys of Nickel as well as heavy Nickel plate give trim and hardware their bright, durable, silvery lustre.

Aboard your motor boat Nickel irons and Nickel steels minimize the risk of engine failures, while gleaming Nickel silver and other Nickel-alloyed decorative metals provide corrosion-free bright-work. Galley equipment is made of silvery Monel Metal, a high Nickel alloy, while underwater a propeller shaft of this same sturdy corrosion resistant alloy smoothly transmits the power of the engine to the Monel Metal propeller.

Nickel...

IN YOUR RADIO

Every metal part of the screen grid tube is either made of Nickel or contains Nickel as the principal ingredient.

Even when you wade your favorite trout stream, Nickel helps you cast your fly. For Nickel is widely used in reels, rod ferrules and trimming. It is also used in braided trolling lines, lures, etc.

Not only in the field of Recreation, but in every field where man uses metals, there is an alloy containing Nickel that can be employed to fill some particular role more dependably and more economically.

These alloys embrace a variety of compositions, each developed and firmly established as a result of laboratory and service tests. They offer a wide range of improved properties... properties that assure increased resistance to heat, stress, fatigue, erosion, corrosion and wear.

Among them are Nickel Alloy Steels, Nickel Cast Irons, Nickel Bronzes, Stainless Steels, etc... all of which are commercially available in every important metal consuming center. If you are planning to build new equipment or modernize the old, our engineers will be glad to advise you concerning the most suitable applications.

•

THE INTERNATIONAL NICKEL COMPANY, INC.

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the tendency of steel to solidify rather rapidly, it may be pointed out that extensive experimental work by the firm provides sufficient evidence of its practicability on certain types of castings. While steel begins to solidify at a comparatively high temperature, the extremely short time elapsing between finishing the pouring and commencement of rotation of the table, hardly permits more than a solid skin to form. Types of castings on which the centrifugal method is employed are those in which a side or end gate is used, and of which Fig. 3 is a typical example. That illustration shows the cope and drag molds for a disk for a gate-type valve.

Fig. 4 shows a gate valve casting before the risers and gate were removed. As may be observed, it was molded on its side with heavy risers on the three flanges. The casting was gated on the parting line by a double-branch gate feeding into both sides of the flange at that point.

Oven for Drying Lime-Coated Rods Is Direct Fired

DRYING the lime coating on the surface of wire rods is the purpose of a recently built direct-fired baking oven. Of particular interest is the combustion system, the method of recirculation and the arrangement of the heat and return ducts, which combine with the periodic opening and closing of the charge and discharge doors.

The dry house, 14 feet wide, 42 feet long and 7 feet wide, is double tracked and has a capacity of 12 tons of coiled rods an hour. Coils are carried through the heating chamber on buggies which operate on and are guided by channel tracks. Movement of the buggies through the ovens is by gravity. A mechanism is provided which releases to discharge a buggy when one is pushed in at the charging end. The heater and appliances are mounted on top the oven to conserve floor space. The temperature of the oven can be varied from 200 to 250 degrees Fahr., as required for various classes of work ad is controlled automatically at the desired degree.

Waste Gases Mixed with Air

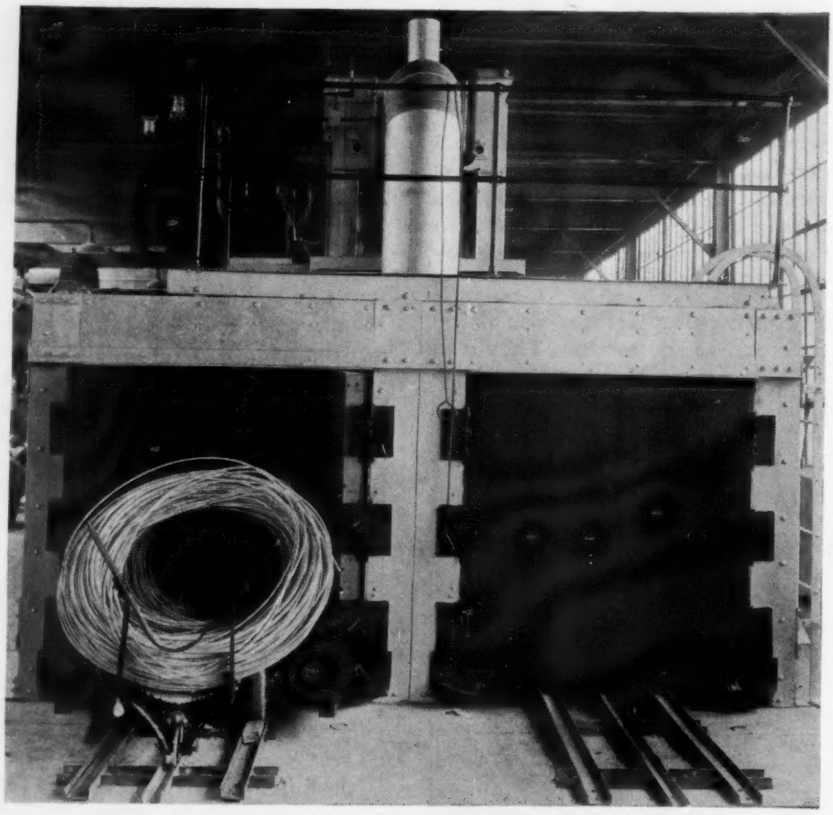
Fuel oil is burned in a primary combustion chamber and the products of combustion liberated to the mixing chamber where they combine with the return air from the oven and are brought to the desired temperature for introduction to the dry house. Safety devices provide protection against fuel, air and ignition failure.

The oven, shown in the accompanying illustration and designed by the engineering staff of Russell, Burdsall & Ward Bolt & Nut Co., recently was placed in service at the company's plant at Rock Falls, Ill. The recirculating type oil-fired heater and the arrangement of the heat and return ducts were designed and built by the Mahr Mfg. Co., Minneapolis.

From 50 to 60 buggies, each weighing 500 pounds, pass through the bake oven in 8 hours. A temperature of 300 degrees Fahr. is maintained within the heating chamber. The net weight of rods treated and the fuel consumption for various 8-hour periods follow:

Rods treated, pounds	Fuel consumption, gallons
76,500	42
87,600	28
82,300	34
87,100	48
100,700	40
106,300	34

The variation in the fuel consumption per ton of material dried is because the heating time is the same regardless of the size and the weight of the load. The 82,300 pounds of rods, which required 34 gallons of oil, involved rods of small diameter, while the 106,000 pounds, which required the same quantity of oil, applies to rods of large diameter. The average cost per ton of rods dried for a period of 30 days was slightly under 4 cents per ton, based on fuel oil at $0.0429 per gallon.



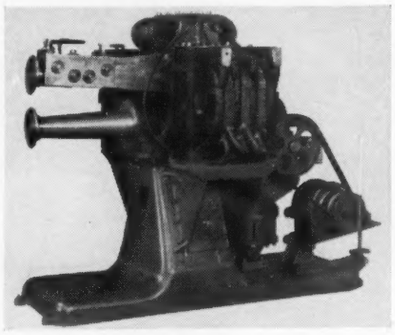
Continuous type direct-fired oven for baking the lime coating on the surface of wire rods

Williamsburg, Va., Buys Old Fashioned Lamp Posts

An unusual order for 75 cast iron lamp standards has been received by the Cleveland lighting headquarters of the Westinghouse Electric & Mfg. Co. It reveals the part that illumination is to play in the re-creation of colonial times at Williamsburg, Va. The order calls for four types of standards and two types of lanterns. These are to be installed and equipped so as to reproduce as nearly as possible the original type of street lighting which was provided in this city while it was the capitol of the Virginia Colony during the eighteenth century.

Manganese to a maximum of 0.35 per cent in malleable iron increases strength and yield point, but also increases the annealing time.

Welding Machines — Taylor-Winfield Corp., Warren, O., recently developed spot and roll seam welders especially adaptable to welding of heat treated aluminum alloys. The accompanying illustration shows the roll seam welder. Twin transformer construction provides uniform distribution of power with minimum reactance and resistance losses.



Taylor-Winfield roll seam welder for welding circular seams

The lower roll is driven, eliminating all unnecessary weight from the upper roll which is carried at the end of an arm made of a special light alloy giving maximum strength and electrical conductivity. This upper roll carrying arm is operated by a cushioned air cylinder, and the roll pressure is adjusted and maintained uniformly through a pressure reducing valve. These features are particularly valuable because the slightest hammer-blow effect when the rolls come in contact with the work has a tendency to bed them into the alloy, adversely affecting the welding. An infinitely variable speed drive permits a welding speed range of from 40 to 240 inches per minute. The welding heat is controlled in close steps through an auto-coil with twenty-step regulator, and a GE thyratron unit is preferable for proper interruption of the welding current.

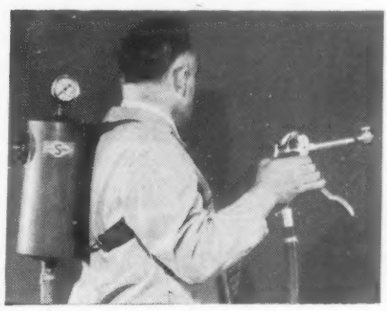
♦ ♦ ♦

Lapping Wheels—Thomas Prosser & Son, 15 Gold St., New York, announce that Spedia wheels (a diamond impregnated molded bakelite lapping wheel) now are available in an extra fine grade for polishing Widia and other cemented carbides. Also available is a taper cup wheel 3 inches in diameter for use on cutter grinders, in regular lapping grade. With these two additions to the line, many more Widia and other cemented carbide tools can be properly resharpened by the user to permit obtaining longer life between grinds, and better finish on the work, the manufacturer declares.

♦ ♦ ♦

Industrial Grease Gun—Specialty Sales & Service Corp., 138 Holden street, Minneapolis, recently placed on the market a triple S portable grease gun with straps to enable the operator to carry the tank on his back as shown in the accompanying illustration, or it also can be supplied with a stand. The gun is designed for industrial plants and a wide variety of other applications.

By actuating the handle the operator causes pressure to be built up in the piston chamber, thus discharging grease from the gun head. When resistance is encountered in the bearing, the gun head develops ample pressure to fill extremely tight bearings. The tank holds 10 pounds of grease. A number of attachments are available with the equipment.



Triple S portable grease gun with straps for carrying tank about

♦ ♦ ♦

Regulator—American Heat Economy Bureau Inc., 926-930 Wabash building, Pittsburgh, recently placed on the market a regulator that is particularly adaptable for draft control on open hearth furnaces, as well as to side-door heating furnaces, especially where furnace atmosphere is important. From the accompanying illustration, it will be seen that the motive power is derived from a motor which runs continually at a constant speed. This motor operates a reversible planetary gear transmission, that in turn moves the output shaft which can be connected by a lever or other means to the device to be controlled. The diaphragm of the regulator operates a pendulum to make and break contact with the electrical circuit.

Contacts *A* and *B* are connected respectively to solenoids *A* and *B* and as either of these solenoids are energized they engage and hold the ring gear of the transmission, causing the output shaft of the apparatus to rotate in one direction or the other, depending on the particular solenoid energized. When neither solenoid is energized the transmission idles and the output shaft remains stationary. The diaphragm employed with this regulator can be supplied to attain any degree of sensitivity desired.

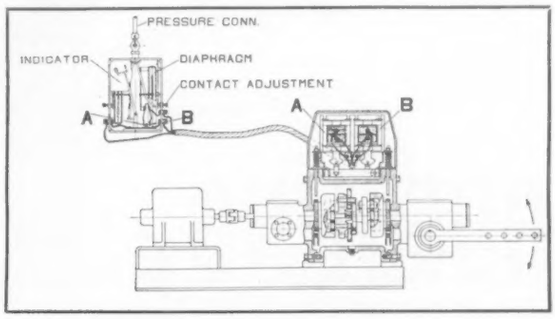
♦ ♦ ♦

Temperature, Pressure Controller—Foxboro Co., Foxboro, Mass., has developed a temperature and pressure controller which is housed in a cast aluminum and bronze case that may be used for either surface or flush mounting. The new setting arrangement is as simple and easy to handle as a radio dial, it is asserted. By turning a knob, the operator can set the instrument at any desired temperature or pressure within its range. All standard bulbs are available to fit ranges of —60 to 1000 Fahr. Pressure ranges available cover 15 to 500 pounds per square inch.

♦ ♦ ♦

Sealing Compound — Ideal Commutator Dresser Co., industrial division, Sycamore, Ill., has developed a new universal sealing compound which is nonsoluble, noncorrosive, and non-oxidizing. It comes in paste

REGULATOR designed to meet exacting requirements of modern industrial plants. American Heat Economy Bureau Inc., Pittsburgh, is marketing the unit



Yes— IT'S THE STEEL

IT'S THE CUSTOM-MADE STEEL THAT SPELLS THE DIFFERENCE!

CUSTOM-MADE Steel? What does it mean? It means just this...that the steel for Roebling Welding Wire is made specifically for welding purposes. It is *not* made on the usual tonnage basis but in small open-hearth furnaces... Of special, pure melting stock... By custom methods that permit exceptionally close control of the melt.

RESULT: A welding wire for exacting welders ...free of non-metallic inclusions...and absolutely uniform in quality.

We would welcome your request for full information and samples. Roebling Custom-Made Welding Wire is available in both electric and gas types.

JOHN A. ROEBLING'S SONS CO., TRENTON, N. J.
Branches in Principal Cities Export Dept.: New York, N.Y.

ROEBLING WELDING CABLES: these cables are made in a complete line for arc welding purposes. Many leading welders consider them to be the finest welding cables on the market. Samples, data and prices gladly furnished.

PLAIN RUBBER TYPE
Roebling Welding Cable

BRAIDED TYPE
Roebling Welding Cable

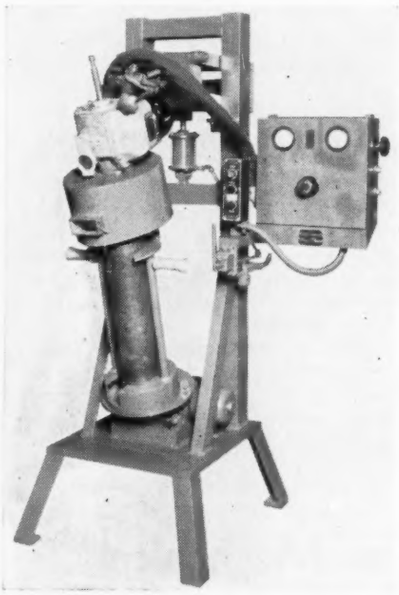
ROEBLING *Custom-Made* WELDING WIRE

form, can be spread as thin as 0.001-inch, seals instantly, yet does not harden or become brittle.

When used in connection with gaskets, or without them, or as a seal for flanged or threaded joints in fuel oil, steam, water, air, gasoline, lubricating oil, or in any type or size of pipe line, this seal cannot be washed out. It is not affected by atmospheric conditions and is heat resisting up to 400 degrees Fahr. It prevents rust or corrosion, and may be applied on any material or surface. It seals as perfectly as shellac, it is said, and yet permits quick and ready disassembly at any time.

♦ ♦ ♦

Automatic Welder—Lincoln Electric Co., Cleveland, is announcing automatic machines for welding automobile muffler assemblies by the shielded carbon arc process. The machines are equipped with electronic Tornado welding heads and have a production capacity of 115 mufflers per hour.



Lincoln automatic machine for welding automobile muffler assemblies

The equipment used consists of two machines, one a vertical machine as shown in the accompanying illustration, and the other a horizontal machine. With the welder illustrated the operator places the muffler in position, lowers the welding head, edge welds the tubes in place, raises head and turns muffler upside down and welds the pipes on the other end. The complete operation requires 30.5 seconds. Approximately 118 mufflers per hour may be welded with this machine. Actual welding is at the rate of 63 feet per minute.

A second machine lap welds muffler tubes for connection to the exhaust pipe. Floor to floor time is 112 mufflers per hour. In one installation in a large plant two men operate four of these automatic welders. The welding head remains stationary while the parts being welded revolve under the arc. These automatic muffler welders can be obtained for welding various types of mufflers. The welding head used is of the same type as that employed for hundreds of different automatic welding applications.

♦ ♦ ♦

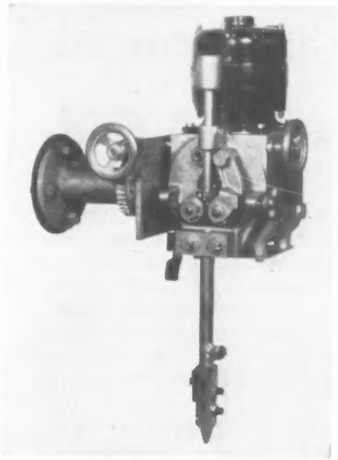
Platform Scale—Kron Co., Bridgeport, Conn., recently developed a cabinet or unit weight type dormant platform scale which comes equipped with from 1 to 4 unit weights, depending on the specifications. The scale, shown herewith, is so arranged that by pressing down on the first handle a unit weight equal to the capacity of the dial is added to the weighing system. By pressing down the second handle a second weight equal to the dial capacity is added and so on, or if it is desirable to add the whole 4 unit weights at one time this can be done by simply pressing down the fourth handle.

Weight thus added is shown in a small window on the dial face. The scale is used where larger loads are to be weighed by small increments and where it would be impractical to graduate the dial to the small graduations necessary. A standard free-floating platform is used in this assembly, and the indicating mechanism is an improved one-cam translation ball bearing type. The unit is finished in black baking crystal with chromium plated trim.

Kron cabinet or unit weight type dormant platform scale

♦ ♦ ♦

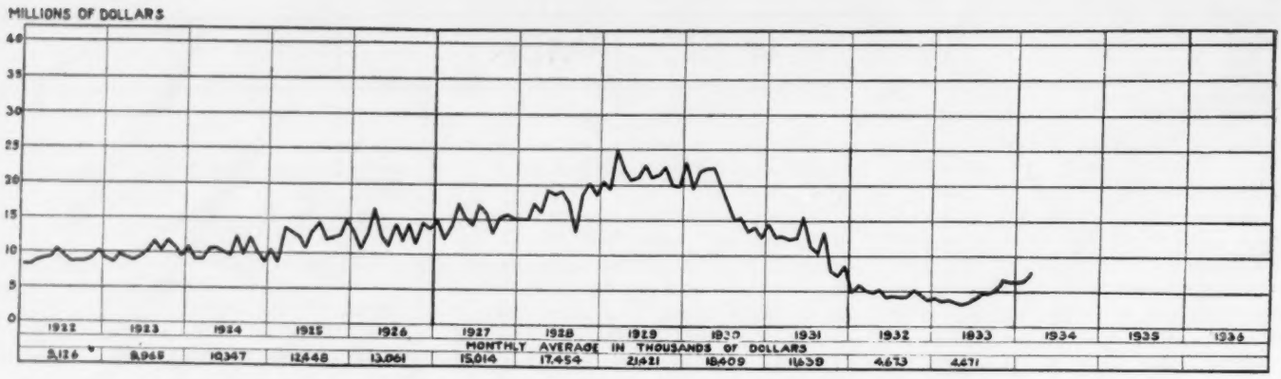
Arc Welding Head—General Electric Co., Schnectady, N. Y., recently placed on the market an improved automatic arc welding head designated type WFA. One small motor drives the electrode feed rollers through a worm reduction gear and three-speed transmission. At any of the three speeds, selected to suit electrode size, current, and rate of deposition of metal, the electrode is fed at a uniform rate and the arc voltage is maintained accurately. One small rheostat is the only adjusting element necessary.



Automatic arc welding head built by General Electric Co.

The welding head, shown herewith, consists of an insulated mounting support, an end plate which can be rotated and to which is attached an aluminum alloy gear case containing the speed reduction and transmission gears. The motor has adequate power, not only to feed the electrode but to straighten it as it comes off the reel. A circular aluminum alloy plate carrying nozzle, wire guide, feed rollers, and feed-roller-pressure-adjusting knob is mounted on the left side of the gear case and can be rotated by means of a handwheel. A gear-shifting dial on the right side of the case permits ready selection of the desired transmission ratio.

The electric control equipment consists of an enclosed panel on which are mounted standard relays and contactors which maintain in proper sequence the operations necessary in starting, running, and stopping the automatic arc-welding head, and an instrument panel.



Exports of industrial machinery from the United States by months

Sights Improved Opportunities for Machinery Orders in Export Field

AN OPPORTUNITY to secure urgently needed machinery orders is presented in the export field, in the opinion of Robert E. W. Harrison, chief of the machinery and agricultural implements division of the bureau of foreign and domestic commerce. Exports of industrial machinery dropped to a low point, slightly under $3,300,000, in May, 1933, but have steadily climbed since that time until a figure of something over $8,000,000 was reached in March of this year. This uniform upward tendency is in marked contrast with the "spotty" condition of domestic business during the same period, and points clearly to the desirability of an increase of activity on the part of machinery exporters.

The gain in exports is particularly encouraging when it is realized that as yet practically no measures for the revival of foreign trade have been put into operation. The only favorable factor occurring in the past year has been the drop in the value of the dollar which has made it easier from the standpoint of exchange for foreign buyers to pay for goods purchased in the United States.

The accompanying chart showing exports of industrial machinery from the United States since 1922 clearly indicates the importance of the machinery export trade. Prior to 1932, the lowest monthly average shipments occurred in 1922 with a value of $9,126,363. From 1922 to 1929 the gain was continuous, reaching $21,420,914 in 1929 and falling off slightly to $18,409,417 in 1931 after which came the decline from which we are now emerging.

Machinery purchased in the last decade is wearing out and rapidly becoming obsolete. Recovery measures in Europe and the Far East require new equipment which can be supplied by the United States. The markets, however, need diligent analysis and exploitation on the part of American manufacturers more than at any time in the past.

The chart indicates clearly that now is the time to begin. The rising exports show that the markets exist. The machinery division of the department of commerce has the statistical and market information to point out where the machinery can be sold. The major requirement at the moment is initiative on the part of the exporter to go out and get the orders.

Reports Element No. 93

According to a report to the Italian Lincei academy by Senator Mario Corbino on June 4, Enrico Fermi, a member of the academy has discovered a new element, known as No. 93. It was created artificially from uranium, and is said to be radioactive, with chemical properties analogous to those of manganese. It also is claimed to be the hardest element known to man.

Book on Twist Drills Is Issued by British Firm

A treatise on twist drills has been published by Edgar Allen & Co. Ltd., Sheffield, England. The book, entitled "Twist Drills," is by B. H. Chambers, manager of the small tools department of the company. The principal topics covered are the history of twist drills, methods of manufacture, drill shanks and tangs, special types of drills, problems of drilling various materials including manganese steel, grinding of drills, and practical information on performance, alignment, etc. The book consists of 144 pages and is issued in cloth bound and paper bound editions. A nominal sum is charged, details of which may be had upon application to the company.

Publishes 50 Reports on Mechanical Transmission from Motor Drives

A WEALTH of practical information on belt and other drives is found in "Fifty Reports on Mechanical Power Transmission From Motor Drives to Industry," by Robert W. Drake, a 226-page, paper covered book, published by the American Leather Belting association, 41 Park Row, New York.

While the cost of preparing these reports was underwritten by 35 manufacturers of leather belt and mechanical power transmission equipment, the work is entirely free from propaganda. The advantages and disadvantages of various types of transmission seem to have been handled impartially. Throughout the book the motive of the author apparently is to help the manufacturer to solve his transmission problems rather than to lay stress upon the equipment itself.

The first eight reports deal with the fundamentals of belt drives. The author discusses load fluctuations, torque belt tension, etc., and throughout these studies emphasizes the necessity of choosing a belt which will meet the requirements of maximum load the belt will have to carry.

Report No. 9, probably the most

generally useful part of the entire volume, is entitled "How To Size Motor Belts for Ordinary Open Drives." In this report are six pages of two-color charts showing data for average and severe drives for three groups of motor speeds and for horsepowers ranging from ½ to 100. Explicit directions for using these charts are included in Report No. 9. The next nine reports contain much information upon such subjects as minimum pulley diameters, maximum belt widths, centrifugal force and tension, how to determine actual tension per inch of width, present status of belt theory and numerous answers to correspondents' questions. Reports 19 to 25 inclusive deal with short center drives, including gear drives and gear reducers, gravity idlers, multiple V drives, Rockwood drives, silent chain and miscellaneous drives. Report No. 26 is an interesting discussion of annual contract accounts, while Report No. 27 deals with the fascinating subject of "How To Approach a Trouble Job." The six subsequent reports treat in detail other trouble jobs and how to lick them.

For many years engineers, operating men and others have argued the timeworn problem of modern group drives versus individual drives. Mr. Drake tackles this controversy in eight reports. After reading his discussion you will understand that neither drive may be applied universally; each has its proper place. The bulk of these eight reports is devoted to explaining where each may be used to best advantage.

Separate reports for drives for fans, woodworking plants and air compressors follow, after which the efficiency of belt drives is considered. Suggestions for figuring the driven pulley speed accurately are presented. The difficult subject of rider belts is treated in seven pages. Report No. 49 deals with belt ratings. The final report serves as the appendix for the previous 49. A comprehensive index completes the book.

A small charge is asked for the book, details of which may be obtained from the association, at the address given in the first paragraph of this review.

New Edition of Shape Book Issued

THE 24th edition of the *Carnegie Pocket Companion* issued by the Carnegie Steel Co. and Illinois Steel Co., subsidiaries of the United States Steel Corp., is just off the press. The new volume is revised and enlarged from earlier editions and contains the profiles and data for sections most suitable for all structural purposes, including bridges, building, car and ship construction.

Approximately 150 pages are devoted to profiles, elements and dimensions of standard shape and Carnegie beam sections. Next appear over 150 pages of tables and other data on safe loads for beams. Thirteen pages are devoted to notes and tables on plate girders, following which is a large section dealing with notes, formulas and tables on safe loads for columns, including useful information on base plates and grillage foundations.

Under structural details are discussions on stresses of rivets and pins and tables on shearing and bearing values of bolts, pins, rivets, etc., also data on rivet spacing, dimensions of rivets, bolts, screws, clevices, etc.

Complete information on floors, with load tables and data on various types of floor construction such as tile, open-web steel joists, reinforced concrete, etc., is given. Similar data for roof trusses also are presented. The usual tables of weights and measures, functions of numbers, natural trigonometric functions and standard gages conclude the volume.

Information in regard to obtaining copies of this book may be had by writing the general or nearest district office of the issuing companies.

New Trade Publications

CONDENSATION—Nason Mfg. Co., 71 Fulton street, New York, has issued catalog No. 33 discussing various types of traps which may be employed in the solution of condensation problems.

TRIANGLE DRILLS—A folder by the Rawlplug Co. Inc., New York, features a new idea in drilling by hand in masonry, a drill with a triangular point. Diagrams show advantages claimed for this form of drill.

BURNERS — Surface Combustion Corp., Toledo, O., has issued a bulletin on its burners, applicable to many industrial uses, with special reference to economies possible by proper equipment.

CONVEYORS—A bulletin has been issued by Chain Belt Co., Milwaukee, covering Rex-Stearns-Timken idlers for its bulk conveyor belts. Illustrations show the wide application of this equipment in industry.

ROLL GRINDERS — Landis Tool Co., Waynesboro, Pa., in catalog H-34 describes its hydraulic roll-grinding machines in 16, 20, 24 and 28-inch sizes. Details of the equipment are illustrated. Tables of specifications are included.

COMBUSTION METERS — Hays Corp., Michigan City, Ind., has issued its catalog RA-34 on its combustion meters for CO_2 only and for CO_2 combined with records for overfire draft and fluegas temperature. Ample illustrations supplement the text.

STRAIGHTENER—A roll feeding straightener is presented in a current bulletin by the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., illustrated to show its various uses and reciting advantages from use of coiled strip.

INDICATING PYROMETER—Foxboro Co., Foxboro, Mass., has published bulletin 192, illustrating and describing its potentiometer type indicating pyrometer. The temperature scale on the unit is drawn on a dial six inches in diameter and provides 17 inches of actual temperature scale, so that it can be divided finely and read with great precision.

COLD-DRAWN STEEL — Union Drawn Steel Co., Massillon, O., has issued a bulletin describing processes that improve the quality of steel, with explanation of what improvement can be made and why its effects are produced.

GAS TRACTOR—Mercury Mfg. Co., 4118 South Halsted street, Chicago, in Bulletin No. 160, explains its "trackless train" method of materials handling, with special emphasis on its gas tractor and special type of trailers. Illustrations make the descriptions clear.

PUMPS—Worthington Pump & Machinery Corp., Harrison, N. J., has published a bulletin on its two-stage volute centrifugal pumps. The publication gives lists of parts for two types of pumps and discusses the specifications for the units. Dimensions also are included.

ELECTRICAL EQUIPMENT—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has issued a bulletin on its electrical equipment for automatic roller and catcher tables in sheet mills, to meet the severe requirements of this service. It is well illustrated to show details.

PORTABLE FURNACE—A portable heat treating and carburizing furnace, enclosed front type, suitable for annealing, hardening, normalizing, carburizing, drawing and other uses is described in a bulletin by W. S. Rockwell Co., manufacturer of industrial heating equipment, 50 Church street, New York.

ALLOY STEEL—American Manganese Steel Co., 6600 Ridge avenue, St. Louis, has published a folder on its special series of cast nickel-chromium alloys made for resisting heat, corrosion or acids. The publication includes a view of the plant, interior views showing equipment and methods, and photographs of numerous types of castings produced.

Steel Foreign Trade in April Below March; Over 1933 Rate

EXPORTS of iron and steel products from the United States in April totaled 201,539 gross tons, a decrease of 59,730 tons from the 261,269 tons exported in March, according to compilations of the bureau of foreign and domestic commerce, Washington.

April exports were 121.4 per cent higher than those of April, 1933, which were 91,045 tons. Imports also decreased in April from the March total, April showing imports of 26,862 gross tons and March 38,393 tons, the loss being 30.1 per cent.

In four months of 1934 exports totaled 792,015 gross tons, which is 171 per cent greater than the 292,217 tons exported in four months of 1933. Imports in the first four months of 1934 were 113,315 tons, a rise of 23.7 per cent over the 91,518 tons imported in the same period of 1933.

Lessened exports of scrap gave a loss of 46,298 tons, which is almost equal to the total difference between exports of March and April. Other important decreases were: Tin plate 15,768 tons; galvanized sheets, 3284 tons; skelp 1207 tons. Gains in exports were registered in heavy steel rails, 4175 tons; plain shapes, 2087 tons, steel bars 1707 tons, steel plates, 1635 tons.

Steel scrap was the largest item of export in April at 126,687 gross tons. Japan took 55,113 tons, United Kingdom 23,994 tons, Canada 12,118 tons, Poland and Danzig 11,962 tons, Italy 10,879 tons and Germany, China, Belgium and Mexico smaller tonnages.

Tin plate was second largest export item at 11,496 tons, heavy rails third with 7916 tons, of which 3699 tons went to Brazil, black sheets third with 7134 tons and steel bars fifth in small lots to a number of countries.

Pig iron was the principal item of import, 8253 tons, of which 6609 tons came from the Netherlands. Canada supplied 5036 tons of the 5214 tons of scrap imported. Imports of structural shapes were 1821 tons, of which Belgium contributed 1305 tons and France sent in 440 tons.

The Netherlands were the chief source of imports, its shipments of pig iron being 6609 gross tons and barbed wire 272 tons. Canada was second in imports into the United States, with 5036 tons of scrap, 1017 tons of ferromanganese and 199 tons of pig iron. Belgium was third with 4432 tons, including 1305 tons of shapes, 1045 tons of hoops and bands and 1432 tons of merchant and other steel bars.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1934		1933	
	Imports	Exports	Imports	Exports
Jan.	22,653	178,023	21,892	56,720
Feb.	25,407	151,184	19,748	63,936
Mar.	38,393	261,269	22,114	80,567
April	26,862	201,539	28,061	100,395
4 mo.	113,315	792,015	91,518	292,217
May	.....	.....	26,295	123,069
June	.....	.....	34,368	102,581
July	.....	.....	52,805	83,311
Aug	.....	.....	46,839	119,374
Sept.	.....	.....	55,706	108,799
Oct.	.....	.....	46,673	164,755
Nov.	.....	.....	28,979	157,600
Dec.	.....	.....	31,310	184,585
Total	.....	.....	414,790	1,350,692

ORIGIN OF APRIL IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferromanganese
Netherlands	6,609	.....	.....
Norway	402	.....	1,253
Kwantung	147	.....	.....
Canada	199	.....	1,017
Chile	25	390	.....
British India	871	771	.....
Germany	.....	8	.....
Gold Coast	.....	876	.....
Soviet Russia in Europe	.....	13,568	.....
Brazil	.....	4,100	.....
Cuba	.....	3,125	.....
France	.....	.....	17
Italy	.....	.....	65
Poland	.....	.....	159
United Kingdom	.....	.....	160
Total	8,253	22,838	2,671

	Sheets, skelp and sawplates	Structural steel	Steel bars	Hoops and bands
United Kingdom	4	.....	21	17
Belgium	355	1,305	1,432	1,045
Germany	303	76	216	215
Sweden	10	.....	333	7
France	.....	440	54	139
Canada	.....	.....	2	.....
Austria	.....	.....	7	.....
Czechoslovakia	.....	.....	9	.....
Total	672	1,821	2,074	1,423

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	April 1934	March 1934	April 1933
Pig iron	8,253	20,674	17,875
Sponge iron	127	121	10
Ferromanganese, spiegeleisen	2,671	3,061	2,223
Ferrochrome	.....	2	16
Ferrosilicon	55	28	.....
Other ferroalloys	.....	.....	.....
Scrap	5,214	6,056	149
Steel ingots, blooms, etc.	35	179	21
Concrete bars	26	26	150
Hollow bar, drill steel	70	63	94
Merchant steel bars	2,074	1,031	951
Iron slabs	.....	.....	.....
Iron bars	158	17	18
Wire rods	1,208	1,300	542
Boiler and other plate	.....	26	16
Sheets, skelp, saw plate	672	371	812
Tin plate	2	23	35
Structural shapes	1,821	1,761	1,920
Sheet piling	.....	.....	94
Rails and fastenings	321	201	63
Cast iron pipe and fitt'gs	.....	.....	164
Welded pipe	107	109	111
Other pipe	375	302	159
Barbed wire	855	444	456
Round iron, steel wire	224	241	244
Telegraph, telephone wire	.....	1	.....
Flat wire, strip steel	131	122	46
Wire rope, strand	154	130	145
Other wire	61	93	261
Hoops and bands	1,423	1,273	1,031
Nails, tacks, staples	615	540	323
Bolts, nuts, rivets	48	18	37
Horse and mule shoes	47	30	22
Castings and forgings	115	150	73
Total	26,862	38,393	28,061

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	April 1934	March 1934	April 1933
Pig iron	310	186	335
Ferromanganese, spiegeleisen	6	2	.....
Iron and steel scrap	126,687	173,165	64,774
Ingots, blooms, billets, slabs and sheet bars	260	766	245
Bars, iron	51	25	36
Bars, steel	4,828	3,121	1,593
Bars, alloy steel	343	347	105
Wire rods	1,795	1,180	1,488
Boiler plate	111	152	6
Other plate, not fabricated	3,338	1,703	219
Skelp, iron or steel	1,042	2,249	512
Iron sheets, galvanized	105	213	40
Steel sheets, galvanized	4,454	7,738	2,178
Steel sheets, black	7,134	7,194	1,572
Iron sheets, black	449	349	132
Strip steel, cold-rolled	1,682	1,431	333
Hoop, band and scroll iron or steel	1,427	1,607	769
Tin, terne plate	11,496	27,264	3,501
Water, oil, gas and other tanks, except lined	392	758	104
Shapes, not fabricated	3,365	1,278	680
Shapes, fabricated	1,236	882	1,173
Plates, fabricated	285	80	7
Metal lath	54	107	100
Frames, sashes and sheet piling	112	691	74
Rails, 50 pounds	7,916	3,741	1,633
Rails, under 50 pounds	532	11	.....
Rail fastenings	623	1,165	121
Switches, frogs, crossings	63	183	22
Railroad spikes	115	215	31
Railroad bolts, nuts	69	207	17
Boiler tubes, seamless	567	355	285
Boiler tubes, welded	72	16	5
Casing and oil-line pipe, seamless	2,479	2,721	3,021
Casing and oil-line pipe, welded	2,228	2,179	88
Seamless black pipe, other than casing	137	578	54
Malleable iron screwed pipe fittings	214	222	127
Cast iron screwed pipe fittings	121	163	49
Cast iron pressure pipe and fittings for	142	1,302	303
Cast iron soil pipe and fittings for	166	98	69
Welded black steel pipe	2,133	2,431	610
Welded black wrought iron pipe	53	64	77
Welded galv. steel pipe	2,272	2,610	826
Welded galv. wrought iron pipe	58	36	21
Riveted iron or steel pipe and fittings	14	31	8
Plain iron, steel wire	952	1,227	299
Galvanized wire	1,678	1,615	268
Barbed wire	3,047	3,115	1,034
Woven wire fencing	137	118	77
Wowen wire screen cloth	67	62	42
Wire rope	339	220	141
Insulated iron, steel wire, cable	.....	.....	.....
Other wire and manufactures	438	328	251
Wire nails	1,461	1,300	431
Horseshoe nails	83	76	21
Tacks	45	48	33
Other nails, staples	379	427	167
Bolts, machine screws	451	295	282
Iron castings	472	907	94
Steel castings	426	61	28
Car wheels and axles	262	306	228
Horseshoes	21	6	23
Iron and steel forgings, n. e. s.	345	342	283
Total	201,539	261,269	91,045

Rush for Steel Lifts Rate Back to 62 Per Cent

Price Advances Exert Stronger Influence Than Strike Threat—Automobile Output Up Slightly—May Ingot Output Best Since June, 1930

TIME factors intensified steel demand last week, consumers' eagerness to obtain material before July 1 when iron and steel prices move to a higher level and closer approach of the date set for a contest over unionizing the mills lifting steelworks operations 2 points to 62 per cent.

At Chicago the rate went up 5 points to 70 per cent; at Pittsburgh, 4 to 54. Sheet mill operations as a national average rose 2 points to 70 per cent, influenced largely by releases from automobile manufacturers.

Steelmakers attributed the bulge in specifications more to the proximity of higher prices than to strike threats. Many now have orders for all the tonnage they can produce this month, this being particularly true of sheets and strip.

This artificial stimulus is believed to be obscuring the real trend of consumption, which normally is downward at this time. Automobile manufacturers made 15,000 more cars last week than in the week preceding, but have not recovered from the resistance built up by their price advances earlier in the year, and the effect of over-production.

These manufacturers are speculating as to the possibility for expanding markets. After the strike in their industry a wave of confidence swept over the country, freeing considerable buying power. If the threat of a strike in the steel industry is dissipated they believe another barrier to recovery will be overcome, and expect a revival in purchasing, accelerated by last week's reductions in the f.o.b. prices of automobiles.

Drouth Reduces Implement and Tin Plate Requirements; Shape Awards Improve

Drouth conditions are cutting in seriously on steel demand from agricultural implement manufacturers, and prospects for a much smaller vegetable and fruit pack this year have reduced canmakers' requirements, tin plate mill operations dropping 10 points to 70 per cent.

Railroads are taking bids on third quarter miscellaneous steel requirements, estimated to be lower than the tonnages they bought in the second quarter. Pennsylvania railroad has awarded 500 additional automobile loading devices; Missouri Pacific, 300. Wheeling & Lake Erie is in the market for four locomotives.

Structural shape awards last week increased to 14,705 tons, but were below the weekly average for the year. The Tennessee valley authority is about to purchase 4000 tons of structural shapes for transmission towers. Six thousand tons of concrete reinforcing bars were placed for the government dam at Bonneville, Oreg. The navy has finally approved plans for 24 vessels which will require considerable steel, possibly 50,000 tons.

Revised Steel Code Little Affected by NRA's New Open-Pricing Plan

Because of the provisions in the revised steel code relating to prices, contracting is expected to develop slowly; so far there has been a dearth of orders for that period. The NRA's new open-pricing plan is not expected to affect the fundamentals of the present steel code. Sellers believe its open-price clause will exert a stabilizing effect, even though reductions are no longer subject to group sanction.

Steel ingot production in May averaged 125,807 gross tons daily, 7.1 per cent over April. The rate of gain was much slower than in the preceding months this year, February increasing 25 per cent over January; March 12 per cent over February, and April 13.3 per cent over March. Total output in May—3,396,783 tons—compares with 2,935,631 tons in April, and was the largest of any month since June, 1930. Five months' output this year totals 13,338,035 tons, 109 per cent over the period last year.

Iron and steel exports in April—201,539 gross tons—were 22 per cent lower than March, but 121.4 per cent higher than in April last year. Imports for the month—26,862 tons—were down 30.1 per cent.

In addition to the gains in steelworks operations in the Chicago and Pittsburgh districts, Youngstown advanced 3 points to 66 per cent; Wheeling 5 to 79; Buffalo 2 to 55; eastern Pennsylvania 1 to 46½. Detroit held at 100; Birmingham 55; while Cleveland was off 1 to 78; and New England, 6 to 70.

STEEL's iron and steel price composite is unchanged at $34.77, and the finished steel composite $54.80. Scrap shows more stability, with a decline in the composite of only 8 cents to $10.25.

COMPOSITE MARKET AVERAGES

	June 9	June 2	One Month Ago May, 1934	Three Months Ago March, 1934	One Year Ago June, 1933	Ten Years Ago June, 1924
Iron and Steel Composite	$34.77	$34.77	$34.77	$32.40	$28.73	$40.61
Finished Steel Composite	54.80	54.80	54.80	51.10	45.30	64.38
Steelworks Scrap Composite	10.25	10.33	11.30	12.30	9.55	13.97

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	June 9, 1934	May 1934	March 1934	June 1933
Finished Material				
Steel bars, Pittsburgh	1.90	1.90	1.75	1.60
Steel bars, Chicago	1.95	1.95	1.80	1.70
Steel bars, Philadelphia	2.19	2.19	2.04	1.91
Iron bars, Terre Haute, Ind.	1.75	1.75	1.60	1.65
Shapes, Pittsburgh	1.85	1.85	1.70	1.60
Shapes, Philadelphia	2.05½	2.05½	1.90½	1.65
Shapes, Chicago	1.90	1.90	1.75	1.70
Tank plates, Pittsburgh	1.85	1.85	1.70	1.55
Tank plates, Philadelphia	2.03½	2.03½	1.88½	1.49½
Tank plates, Chicago	1.90	1.90	1.75	1.70
Sheets, No. 10, hot rolled, Pitts.	2.00	2.00	1.75	1.65
Sheets, No. 24, hot ann., Pitts.	2.65	2.65	2.25	2.10
Sheets, No. 24, galvan., Pitts.	3.25	3.25	2.85	2.70
Sheets, No. 10, hot rolled, Gary	2.10	2.10	1.85	1.80
Sheets, No. 24, hot anneal., Gary	2.75	2.75	2.35	2.25
Sheets, No. 24, galvan., Gary	3.35	3.35	2.95	2.85
Plain wire, Pittsburgh	2.30	2.30	2.20	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.25
Wire nails, Pittsburgh	2.60	2.60	2.35	1.85
Semifinished Material				
Sheet bars, open-hearth, Youngs.	30.00	30.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	30.00	30.00	26.00	26.00
Billets, open-hearth, Pittsburgh	29.00	29.00	26.00	26.00
Wire rods, Pittsburgh	38.00	38.00	36.00	35.00

	June 9, 1934	May 1934	March 1934	June 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.76	19.26	17.26
Basic, Valley	18.00	18.00	17.00	15.00
Basic, eastern, del. eastern Pa.	19.76	19.76	18.76	16.19
No. 2 foundry, del. Pittsburgh	19.26	19.26	18.76	16.76
No. 2 foundry, Chicago	18.50	18.50	17.50	16.00
Southern, No. 2, Birmingham	14.50	14.50	13.50	12.00
No. 2X, Eastern, del. Philadelphia	20.63	20.63	19.63	16.76
Malleable, Valley	18.50	18.50	17.50	15.50
Malleable, Chicago	18.50	18.50	17.50	16.00
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.88	18.88	18.38	16.63
Ferromanganese, del. Pittsburgh	90.24	90.24	90.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$11.75	12.80	14.35	11.65
Heavy melting steel, eastern Pa.	10.25	10.90	11.70	9.50
Heavy melting steel, Chicago	9.75	10.85	12.00	8.80
No. 1 wrought, eastern Pa.	11.25	11.55	12.75	10.25
No. 1 wrought, Chicago	9.50	10.25	10.80	8.10
Rails for rolling, Chicago	11.25	12.15	12.75	10.25
Coke				
Connellsville, furnace, ovens	3.60	3.45	3.35	1.80
Connellsville, foundry, ovens	4.60	4.60	4.25	2.40

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	2.00c
Gary, base	2.10c
Chicago, del.	2.13c
New York, del.	2.33c
Philadelphia, del.	2.29c
Birmingham, base	2.15c
St. Louis, del.	2.32c
F.o.b. cars, dock Pacific ports	2.55c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.65c
Gary, base	2.75c
Chicago, del.	2.78c
Detroit, del.	2.85c
New York, del.	2.98c
Philadelphia, del.	2.94c
Birmingham, base	2.80c
St. Louis, del.	2.97c
F.o.b. cars, dock, Pacific ports	3.25c

GALVANIZED No. 24

Pittsburgh, base	3.25c
Gary, base	3.35c
Chicago, del.	3.38c
Philadelphia, del.	3.54c
New York, del.	3.58c
Birmingham, base	3.40c
St. Louis, del.	3.57c
San Francisco, f.o.b. cars, dock	3.85c

TIN MILL BLACK No. 28

Pittsburgh, base	2.85c
Gary, base	2.95c
St. Louis, del.	3.17c

COLD ROLLED No. 10

Pittsburgh, base	2.55c
Gary, base	2.65c
Detroit, delivered	2.75c
Philadelphia, del.	2.84c
New York, del.	2.88c
F.o.b. cars, dock, Pacific ports	3.15c

COLD ROLLED No. 20

Pittsburgh, base	3.15c
Gary, base	3.25c
Detroit, delivered	3.35c
Philadelphia, del.	3.44c
New York, del.	3.48c

ENAMELING SHEETS

Pittsburgh, No. 10	2.60c
Pittsburgh, No. 20	3.20c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	4.90c
Long ternes, No. 24 unassorted	3.65c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.85c
New York, del.	2.13c
Philadelphia, del.	2.03½c
Boston, del.	2.25c
Buffalo, del.	2.08½c
Chicago or Gary, base	1.90c
Cleveland, del.	2.03½c
Birmingham, base	2.00c
Coatesville, base	1.95c
Sparrows Pt., base	1.95c
Pacific Coast, f.o.b. cars, dock	2.40c
St. Louis, del.	2.12c

Structural Shapes

Pittsburgh, base	1.85c
Philadelphia, del.	2.05½c
New York, del.	2.10¼c
Boston, del.	2.23½c
Bethlehem, base	1.95c
Chicago, base	1.90c
Cleveland, del.	2.03½c
Buffalo, base	1.90c
Gulf ports	2.25c
Birmingham, base	2.00c
Pacific Coast, f.o.b. cars, dock	2.40c

Bars

SOFT STEEL

Pittsburgh, base	1.90c
Chicago or Gary, base	1.95c
Duluth, base	2.10c
Birmingham, base	2.05c
Buffalo, base	2.00c
Cleveland, base	1.95c
Detroit, del.	2.05c
Pacific Coast ports cars, dock, c.i.f.	2.45c
Philadelphia, del.	2.19c
Boston, del.	2.30c
New York, del.	2.23c
Pitts., forg. qual	2.05c-2.55c

RAIL STEEL
To Manufacturing Trade

Pittsburgh base	1.80c
Chicago or Gary, base	1.85c
Moline, Ill., base	1.85c
Cleveland, base	1.85c
Buffalo, base	1.90c

IRON

Terre Haute, Ind.	1.75c
Chicago	1.90c
Philadelphia, base	1.99c
Pittsburgh, refined	2.75c-7.50c

REINFORCING
New billet, cut lengths, carlots

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports	3.00c
Philadelphia, del.	2.34c

Rail Steel

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland (Per 100-lb. keg)

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Chicago, Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Shafting □ □ □

Turned and ground, Pitts. base

1⅛-inch	3.40c
1 3/16 to 1½-inch	2.90c
1 9/16 to 1⅞-inch	2.75c
1 15/16 to 2⅞-inch	2.60c
2 15/16 to 7-inch	2.45c

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo. 0.50
4600 .20 to .30 Mo. 125-1.75 Ni. 1.05
5100 .80-1.10 Cr. 0.45
5100 Cr. spring base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon van. 0.95
9250 carbon base plus extras

Strip and Hoops □

Hot strip to 23 13/16-in.

Pittsburgh	2.00c
Do., Chicago	2.10c
Do., Birmingham	2.15c
Do., del. Detroit	2.20c
Do., del. Phila.	2.29c
Do., del. N. Y.	2.33c

Cooperage hoop,

Pittsburgh	2.10c
Do., Chicago	2.20c

Cold-rolled strip,

Pitts., Cleve.	2.80c
Worcester, Mass.	3.00c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pitts., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS
All sizes, cut thread, lag Screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts ..... 70 off

Tire bolts	60 off
Stove bolts, 70-25-10 off in pkgs.; 83 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	75-10 off
Upset, larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.00c
Struc., c. l., Chicago	3.10c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila.	6.00 off

Cut Nails, Piling □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do. less than 5 kegs; no discount on size extras	$3.20
*Steel piling, Pittsburgh	2.15c
Steel piling, Chi., Buff.	2.10c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

In.	Blk.	Gal.
Steel		
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel	
⅛-inch, butt weld	50½
¼—⅜, buttweld	52½
½, butt weld	57½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	

⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES
C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$36.00-37.00
4-in., Birmingham	39.00-40.00
4-in., Chicago	47.00-48.00
6 to 24-in., Chicago	44.00-45.00
6-in., & over, east. fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$90.00

Semifinished Steel □

BILLETS AND BLOOMS
4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$29.00
Philadelphia	34.3*
Duluth	32.00
Forging, Pitts., Chi. and Buffalo	34.00
Forging, Duluth	37.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O.	30.00

SLABS

Pitts., Cleve., Young.	29.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	3.60- 3.85
Connellsville fdry.	4.60
Connell. prem. fdy.	5.35
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	5.50
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	$0.19
90 per cent benzol	$0.19
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)	0.163c
Do. (100 lbs.)	0.173c

Eastern Plants, Per Pound,

†Naphthalene flakes and balls, in bbl.	6.00

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

†Western prices ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Sparrows Point, Md.	19.50	.....	19.00	.....
From Swedeland, Pa., del. to Phila.	20.26	20.76	19.76	.....
From Bethlehem, del. to Brooklyn	21.77	22.27	.....	.....
From Bethlehem, del. to Newark, N. J.	20.89	21.39	.....	.....
Basing Point:				
Everett, Mass.	19.50	20.00	19.00	20.50
From Everett, del. to Boston	20.00	20.50	19.50	21.00
Basing Point:				
Buffalo	18.50	19.00	17.50	19.50
From Buffalo, del. to Boston	20.00	20.50	19.50	21.00
Basing Points:				
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, O.	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
From Detroit, del. to Saginaw, Mich.	20.60	20.60	20.10	21.10
From Cleveland, del. to Akron, Canton, O.	19.76	19.76	19.26	20.26
From Toledo, del. to Mansfield, O.	20.26	20.26	19.76	20.76
Basing Point:				
Jackson, O.	20.25	20.25	19.75	.....
Hamilton, O.	18.50	18.50	18.00	.....
From Hamilton, del. to Cincinnati	19.51	19.51	19.01	.....
Do., del. to Indianapolis	20.77	20.77	20.27	21.27
Basing Points:				
Duluth	19.00	19.00	.....	19.50
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	19.00	18.00	.....
From Duluth, del. to St. Paul	20.94	20.94	.....	21.44
From Chicago, del. to Milwaukee	19.50	19.50	19.00	20.00
From Chicago, Toledo or Detroit, del. to Muskegon, Mich.	21.40	21.40	20.90	21.90
From Granite City, del. to St. Louis	19.00	19.50	18.50	.....
Basing Point:				
†Birmingham, Ala.	14.50	.....	13.50	19.00
From Birmingham, del. to:				
Boston	19.62	.....	19.50	.....
Newark, N. J.	20.51	.....	.....	.....
Brooklyn, N. Y.	21.39	.....	.....	.....
Baltimore	20.02	.....	19.90	.....
Philadelphia	19.88	.....	19.76	.....
Cleveland	18.62	.....	18.50	.....
Cincinnati	19.13	.....	19.01	.....
Chicago	††18.72	.....	18.60	.....
St. Louis	18.62	.....	18.50	.....

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron. ††Over 0.70 phos.

Basing Point:
Provo, Utah ..... 17.50 ..... 17.00 .....

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50
†Off grade material is $19.50

Philadelphia, standard and copper bearing 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	21.00
Pitts. dist. fur.	17.75	Do., del. Chicago	24.04

SILVERY

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.75; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

Iron Ore □ □

LAKE SUPERIOR ORE
Gross ton, 51½%
Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

EASTERN LOCAL ORES
Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE
Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.25-17.75
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00

Manganese Ore □

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%	24.00
So. Afr., 49-51%	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories □ □

Per 1000 f.o.b. Works

FIRE CLAY BRICK
First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00
MALLEABLE BUNG BRICK	
All bases	50.00
SILICA BRICK	
Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00
MAGNESITE	
Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

BASIC BRICK
Net ton, f.o.b. Baltimore, Plymouth Meeting, Pa. Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5 □ □

Washed gravel, duty paid. tide, net ton	$19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$17.00

Ferroalloys □ □

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
del. Pittsburgh	90.24
Spiegeleisen, 19-20%, dom. fur. spot†	26.00
Ferrosilicon 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent. Spot, $5 a ton higher.	126-130.00
Silicomang., 2½ carb.	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 8.50c Conn. copper

Sheets

Yellow brass (high)	14.25
Copper, hot rolled	15.50
Lead, cut, to jobbers	7.75
Zinc, 100-lb. base	9.00

Tubes and Pipes

High yellow brass	16.75
Seamless copper	16.75

Rods

High yellow brass	12.75
Copper, hot rolled	12.75

Anodes

Copper untrimmed	13.25

Wire

Yellow brass (high)	14.75

Old Metals □ □

Deal, buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.75- 5.00
*Chicago	4.37½-4.62½
Cleveland	4.75- 5.00
St. Louis	4.75- 5.00
Heavy Copper and Wire	
*New York	6.12½-6.37½
Chicago, No. 1	5.87½-6.12½
Cleveland	5.75- 6.00
St. Louis	5.50- 5.75
Composition Brass Borings	
New York	4.50- 4.75
Light Copper	
*New York	5.00- 5.25
*Chicago	4.50- 4.75
Cleveland	4.75- 5.25
St. Louis	5.00- 5.25
Light Brass	
*Chicago	2.50- 2.75
Cleveland	2.50- 2.75
Lead	
New York	3.00- 3.25
Cleveland	3.00- 3.25
Chicago	2.75- 3.00
St. Louis	3.25- 3.40
Zinc	
*New York	2.00- 2.25
Cleveland	2.00- 2.25
St. Louis	2.50- 2.75
Aluminum	
*Clipps, soft, Clev.	11.50-12.50
*Borings, Cleveland	6.00- 6.25
*Mixed, cast, Cleve.	9.25- 9.75
Mixed cast, St. L.	11.75-12.00

Secondary Metals □

Brass ingot, 85-5-5-5	8.75
Remelt al. St. No. 12	15.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	10.00-10.50
Boston, dealers	5.50- 5.75
Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	9.50-10.00
Chicago, No. 1	9.50-10.00
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	8.00- 8.50
Detroit, No. 2	7.00- 7.50
Eastern Pa.	10.00-10.50
Eastern Pa., No. 2	8.50- 9.00
Federal, Ill.	8.00- 8.50
Granite City, R. R.	8.50- 9.00
Granite City, No. 2	7.00- 7.50
N. Y., deal. R. R.	8.00
N. Y., deal. No. 2	6.50
Pittsburgh, No. 1	11.50-12.00
Valleys, No. 1	11.50-12.00

COMPRESSED SHEETS

Buffalo, dealers	9.50-10.00
Chicago, factory	8.50- 9.00
Cleveland	8.50- 9.00
Detroit	8.00- 8.50
E. Pa., new mat.	9.50-10.00
Pittsburgh	11.00-11.50
St. Louis	7.50- 8.00
Valleys	11.00-11.50

BUNDLED SHEETS

Buffalo	7.00- 7.50
Cincinnati, del.	6.50- 7.00
Cleveland	7.00- 7.50
Pittsburgh	10.00-10.50
St. Louis	5.00- 5.50

SHEET CLIPPINGS LOOSE

Chicago	5.00- 5.50
Cincinnati	5.00- 5.50
Detroit	4.50- 5.00
St. Louis	4.50- 5.00

STEEL RAILS, SHORT

Birmingham	11.50-12.50
Buffalo	13.00-13.50
Chicago (3 ft.)	11.00-11.50
Chicago (2 ft.)	11.50-12.00
Cincinnati, del.	10.50-11.00
Detroit	10.00-10.50
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft. & less	10.75-11.25

STEEL RAILS, SCRAP

Boston	5.50- 5.75
Chicago	9.50-10.00
Pittsburgh	12.25-12.75

STOVE PLATE

Birmingham	7.00- 8.00
Boston, dealers	3.25- 3.75
Buffalo	9.00- 9.50
Chicago, net	7.00- 7.50
Cincinnati, dealers	5.00- 5.50
Detroit, net	6.00- 6.50
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	6.50- 7.00

COUPLERS, SPRINGS

Buffalo	13.00-13.50
Chicago, springs	11.00-11.50
Eastern Pa.	13.50
Pittsburgh	14.00-14.50
St. Louis	9.50-10.00

ANGLE BARS—STEEL

Chicago	10.50-11.00
St. Louis	9.00- 9.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	13.00-14.00
Cleveland, billet, bloom crops	13.00-13.50
Eastern Pa. crops	15.00-15.50
Pittsburgh, billet, bloom crops	14.75-15.25
Pittsburgh, sheet bar crops	13.75-14.25

FROGS, SWITCHES

Chicago	9.50-10.00
St. Louis, cut	9.00- 9.50

SHOVELING STEEL

Chicago	9.50-10.00
Federal, Ill.	8.00- 8.50
Granite City, Ill.	7.00- 7.50

RAILROAD WROUGHT

Birmingham	6.50- 7.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	7.50- 8.00
Buffalo, No. 2	11.00-11.50
Chicago, No. 1 net	8.25- 8.75
Chicago, No. 2	9.50-10.00
Cincinnati, No. 2	7.50- 8.00
Eastern Pa.	10.00
N. Y., No. 1 deal.	7.25- 7.75
St. Louis, No. 1	5.50- 6.00
St. Louis, No. 2	8.00- 8.50

SPECIFICATION PIPE

Boston	4.50- 4.75
Eastern Pa.	9.00
New York, dealers	3.50- 3.75

BUSHELING

Buffalo, No. 1	9.50-10.00
Chicago, No. 1	8.50- 9.00
Cinci., No. 1 deal.	6.00- 6.50
Cincinnati, No. 2	7.00- 7.25
Cleveland, No. 2	7.00- 7.25
Detroit, No. 1 new	7.00- 7.50
Valleys, new No. 1	11.00-11.50

MACHINE TURNINGS

Bimingham	4.50- 5.00
Boston, dealers	1.25- 1.50
Buffalo	5.00- 5.50
Chicago	5.50- 6.00
Cincinnati, dealers	4.50- 5.00
Cleveland	5.00- 5.50
Detroit	4.50- 5.00
Eastern Pa.	5.50- 6.00
New York, dealers	1.50- 1.75
Pittsburgh	7.50- 8.00
St. Louis	4.00- 4.50
Valleys	7.50- 8.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	6.50- 7.00
Cincinnati, dealers	4.50- 5.00
Cleveland	5.50- 6.00
Detroit	5.50- 6.00
Eastern Pa.	6.00
New York, dealers	1.50- 1.75
Pittsburgh	8.00- 8.50

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	6.50- 7.00
Chicago	5.50- 6.00
Cincinnati, dealers	4.50- 5.00
Cleveland	6.00- 6.50
Detroit	5.50- 6.00
E. Pa., chemical	12.00-15.00
New York, dealers	1.50- 1.75
Pittsburgh	8.00- 8.50
St. Louis	4.25- 4.75

PIPE AND FLUES

Cincinnati, dealers	4.75- 5.25

RAILROAD GRATE BARS

Buffalo	6.50- 7.00
Chicago, net	6.75- 7.25
Cincinnati	4.50- 5.00
Eastern Pa.	8.50
New York, dealers	5.00- 5.50
St. Louis	6.00- 6.50

FORGE FLASHINGS

Boston, dealers	3.75- 4.25
Buffalo	9.50-10.00
Cleveland	8.00- 8.50
Detroit	6.50- 7.00

FORGE SCRAP

Boston, dealers	4.00- 4.50
Chicago, heavy	11.00-11.50
Eastern Pa.	10.00

ARCH BARS, TRANSOMS

St. Louis	11.25-11.75

AXLE TURNINGS

Boston, dealers	4.50- 5.00
Buffalo	9.00- 9.50
Chicago, elec. fur.	8.50- 9.00
Cleveland	6.00- 6.50
Eastern Pa.	11.00
St. Louis	7.00- 7.50

STEEL CAR AXLES

Birmingham	10.50-11.50
Boston, ship, point.	9.00- 9.50
Buffalo	13.00 13.50
Chicago, net	10.75-11.25
Eastern Pa.	14.00-15.00
St. Louis	11.00-11.50

SHAFTING

Boston, ship point.	10.25-10.50
Eastern Pa.	16.00
New York, dealers	10.75-11.25
St. Louis	12.50-13.00

CAR WHEELS

Birmingham, iron	8.50- 9.50
Boston, iron deal.	6.50- 6.75
Buffalo, iron	12.25-12.75
Buffalo, steel	13.00-13.50
Chicago, iron	10.00-10.50
Chicago, rolled steel	10.50-11.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	11.50-12.00
Eastern Pa., steel	13.50
Pittsburgh, iron	11.00-11.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	8.25- 8.75
St. Louis, steel	9.00- 9.50

NO. 1 CAST SCRAP

Birmingham	9.00- 9.50
Boston, No. 2	5.50- 6.00
Boston, tex. con.	10.50-11.00
Buffalo, cupola	10.00-10.50
Buffalo, mach.	11.50-12.00
Chicago, agri. net	7.50- 8.00
Chicago, mach. net	8.50- 9.00
Chi., railroad net	8.00- 8.50
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	11.75-12.25
Detroit, net	8.50- 9.00
Eastern Pa., cupola	12.00
Pittsburgh, cupola	13.00-13.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.25- 8.75
St. L., No. 1 mach.	10.00-10.50

HEAVY CAST

Boston, del.	6.00- 6.25
Buffalo, break	8.50- 9.00
Cleveland, break.	8.25- 8.75
Detroit, break.	6.50- 7.00
Detroit, auto net	9.00- 9.50
Eastern Pa.	10.50-11.00
N. Y., No. 1, deal.	7.00- 7.50
N. Y., break. deal.	6.50- 7.00
Pittsburgh	10.00-10.50

MALLEABLE

Boston, consum.	12.50-12.75
Buffalo	12.50-13.00
Chicago, R. R.	10.50-11.00
Cincinnati, agri. del.	8.00- 8.50
Cinci., R. R. del.	9.00- 9.50
Cleveland, rail	12.00-12.50
Detroit, auto	8.50- 9.00
St. Louis, R. R.	9.00- 9.50
Eastern Pa., R. R.	11.50-12.00

RAILS FOR ROLLING

5 feet and over

Birmingham	10.50-11.00
Boston, dealers	7.00- 7.25
Buffalo	12.00-12.50
Chicago	11.00-11.50
Eastern Pa.	12.00-13.00
New York, dealer	7.50- 8.00
St. Louis	9.75-10.25

LOCOMOTIVE TIRES

Chicago (cut)	11.00-11.50
St. Louis, No. 1	9.75-10.25

LOW. PHOS. PUNCHINGS

Buffalo	13.75-14.25
Chicago	11.00-11.50
Eastern Pa.	14.50-15.00
Pittsburgh	13.50-14.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper			Straits Tin New York		Lead	Lead East	Zinc	Aluminum	Antimony	Ingot Nickel
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures	N. Y.	St. L.	St. L.	98-99%	Spot, N. Y.	
June 2	8.50	8.62½	8.25	52.35	52.25	4.00	3.85	4.30	*22.90	8.25	36.00
June 4	8.50	8.62½	8.25	51.50	51.45	4.00	3.85	4.27½	*22.90	8.25	36.00
June 5	8.50	8.62½	8.25	51.40	51.40	4.00	3.85	4.25	*22.90	8.25	36.00
June 6	8.50	8.62½	8.25	51.85	51.77½	4.00	3.85	4.25	*22.90	7.95	36.00
June 7	8.50	8.62½	8.25	52.50	51.42½	4.00	3.85	4.25	*22.90	7.90	36.00
June 8	8.50	8.62½	8.25	51.95	51.90	4.00	3.85	4.25	*22.90	7.90	36.00

*Nominal range 19.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	3.00c
Boston††	3.05c
Buffalo	2.95c
Chattanooga	3.41c
Chicago	3.05c
Cincinnati	3.25c
Cleveland	3.05c
Detroit	3.13½c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.40c
New York‡(d)	3.32c
Pittsburgh(h)	3.00c
Philadelphia*	3.00c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.29c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	
Portland	3.40c
Baltimore*	3.00c
Chattanooga	3.41c
Chicago	2.75c
Cincinnati	3.25c
New York‡(d)	3.32c
Philadelphia*	3.00c
St. Louis	3.29c
Tulsa	3.25c

REINFORC. BARS	
Buffalo	1.95c
Chattanooga	3.41c
Chicago	2.10c-2.60c
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.15c
Pitts., twisted squares (h)	3.27½c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.44c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	
Baltimore*	3.00c
Boston††	3.22c
Buffalo	3.20c
Chattanooga	3.61c
Chicago	3.25c
Cincinnati	3.45c
Cleveland	3.36c
Detroit	3.45c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.60c
New York(d)	3.42c
Philadelphia*	3.00c
Pittsburgh(h)	3.20c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.49c
St. Paul	3.25c
Tulsa	3.50c

PLATES	
Baltimore*	3.00c
Boston††	3.23c
Buffalo	3.20c
Chattanooga	3.61c
Chicago	3.25c
Cincinnati	3.45c
Cleveland, ¼-in. and over	3.36c
Detroit	3.30c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.60c
New York(d)	3.45c
Philadelphia*	3.00c
Phila. floor	5.00c
Pittsburgh(h)	3.20c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.49c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore*	3.20c
Boston††	3.40c
Buffalo	3.10c
Chattanooga	3.51c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Det., 8-10 ga.	3.28½
Houston	3.35c
Los Angeles	3.80c
New Orleans	3.70c
New York	3.42c
Portland	3.75c
Philadelphia*	3.20c
Pittsburgh(h)	3.10c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.44c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	
Baltimore*†	3.76c
Boston (g)	4.15c
Buffalo	3.25c
Chattanooga	4.41c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	4.16c
Detroit	4.185c
Los Angeles	4.35c
New York	4.05c
Philadelphia*†	3.80c
Pittsburgh**	3.80c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	
Baltimore*†	4.36c
Buffalo	4.00c
Boston (g)	4.75c
Chattanooga	5.01c
Chicago (h)	4.70c
Cincinnati	4.85c
Cleveland	4.76c
Detroit	4.85c
Houston	4.40c
Los Angeles	5.05c
New Orleans	4.95c
New York	4.25c
Pitts.** (h)	4.30-4.60c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	4.40c

BANDS	
Baltimore*	3.30c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.76c
Chicago	3.45c
Cincinnati	3.60c
Cleveland	3.51c
Detroit, ⅜-in. and lighter	3.53½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.95c
New York(d)	3.77c
Philadelphia	3.30c
Pittsburgh(h)	3.85c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.69c

HOOPS	
Baltimore	2.80c
Boston	4.40c
Buffalo	3.55c
Chicago	3.45c
Cincinnati	3.60c
Det., No. 14 and lighter	3.53½c
New York	3.77c
Philadelphia	3.55c
Pittsburgh(h)	3.85c
Seattle	5.60c
St. Paul	3.75c

COLD FIN. STEEL	
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	5.95c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle (f)(d)	4.75c
St. Paul	3.20c
St. Louis	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	5.25c
Chicago (b)	3.45c
Cincinnati	5.80c
Cleveland (b)	3.20c
Detroit	3.33c
Philadelphia	4.00c
New York	4.70c
St. Louis	5.74c

(b) Plus straightening, cutting and quantity differentials.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 7

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	
PIG IRON				
Foundry, 2.50-3.00 Silicon	$15.21	3 0 0	$8.03	1 13 0
Basic bessemer	13.69	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	15.59	3 1 6	....	.....
SEMIFINISHED STEEL				
Billets	$27.89	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	39.55	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$39.29	7 15 0	$26.77	5 10 0
Merchant bars	1.70c	7 10 0	.69c to .72c	3 2 6 to 3 5 0
Structural shapes	1.67c	7 7 6	.63c to .66c	2 17 6 to 3 0 0
Plates, †¼ in. or 5 mm	1.81c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm	2.09c	9 5 0	1.21c to 1.24c	5 10 0 to 5 12 6
Sheets, gal., 24 gage, corr.	2.54c	11 5 0	1.43c	6 10 0
Bands and strips	1.86c	8 5 0	.88c	4 0 0
Plain wire, base	2.20c	9 15 0	1.18c	5 7 6
Galvanized wire, base	2.60c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.71c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 4.37	0 17 3	....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$17.11	3 7 6(a)	$12.56	190	$13.78	295	$24.26	63
Basic bessemer pig iron	16.48	3 5 0(a)*	12.23	185	13.54	290	26.76	(b)69.50
Furnace coke	4.44	0 17 6	7.93	120	5.14	110	7.41	19.25
Billets	27.89	5 10 0	28.42	430	20.55	440	37.15	96.50
Standard rails	1.86c	8 5 0	2.10c	700	2.31c	1,100	2.31c	132
Merchant bars	1.94c	8 12 0	1.68c	560	1.16c	550	1.93c	110
Structural shapes	1.98c	8 15 0	1.59c	530	1.16c	550	1.88c	107.50
Plates, †¼-in. or 5 mm	1.92c	8 10 0	2.10c	700	1.47c	700	2.22c	127
Sheets, black	2.37c	10 10 0§	2.55c	850‡	1.63c	775‡	2.52c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.94c	13 0 0	4.50c	1,500	3.15c	1,500	6.48c	370
Plain wire	2.20c	9 15 0	3.39c	1,130	2.31c	1,100	3.04c	173
Bands and strips	2.37c	10 10 0	1.95c	650	1.47c	700	2.22c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 64

Pittsburgh—Commercial steel bars reflect an active market, supported mainly by demand from automobile builders and miscellaneous manufacturers. Hot-rolled carbon steel bars are quoted 1.90c base, Pittsburgh, and most sellers since June 11 are accepting third quarter business at this price. Rail steel bars to the manufacturing trade are 1.80c, Pittsburgh, and hot-rolled alloy steel bars, 2.55c, Pittsburgh.

Cleveland—Based on specifications in hand, steel bar manufacturers and sellers here feel confident that June shipments will exceed those of May, the largest since the spring of 1930. April releases for bars, plates, shapes and other finished rolled steel products for one interest here were the largest since 1929. Consumers indicate they will take out most of the steel bar tonnage due from this month in winding up second quarter contracts. Automotive tonnage was not so promising, but in other classifications volume last week increased over the week preceding. Contracting for third quarter is slow. Railroads here are taking bids on unstated requirements for that period.

Chicago—Bar specifications continue to receive considerable support from consumers taking material against lower priced contracts, and shipments recently have been well maintained. The declining tendency in automotive demand still is noticeable. Requirements of farm implement manufacturers, while off slightly from the recent peak, remain in fair volume and considerably in excess of that prevailing a year ago. Demand from miscellaneous consumers is steady. Soft steel bars continue 1.95c on third quarter business, with rail steel bars 1.85c. A price for the new Moline, Ill., base on rail steel bars has yet to be announced, but is expected to be the same as Chicago or Gary. For the new Duluth base 2.10c is named. Bar iron at Chicago, a new base, now is 1.90c, effective June 11, while a $2 increase to 1.85c, Terre Haute, Ind., is filed for June 18.

Boston—With third quarter commercial steel bar prices unchanged, buyers show little interest. Demand is well diversified, but shipping orders have been smaller than expected.

Philadelphia—Steel bar producers report improved specifications. Some will be in position, it appears, to accept specifications up to almost the last week, however, as releases until recently have been slow. So far there has been practically no contracting for third quarter and in the instance of iron bars there appears to be no disposition on the part of producers to contract at this time. The belief in some quarters is that higher prices will be announced on iron bars later. Under the code revisions which go into effect today, two eastern basing points have been added for iron bars, namely, Berwick, Pa., and Rockaway, N. J.

New York—Releases of steel bars are disappointing to sellers. Most mills will be able to accept specifications this quarter up to the last week of the month, it is believed.

Plates

Plate Prices, Page 64

Pittsburgh—Marietta Mfg. Co., Pt. Pleasant, W. Va., will require 175 tons of steel plates, 85 tons of wrought iron plates and 20 tons of sheets for a twin screw diesel towboat for Vicksburg, Miss., on which it was reported low bidder last week. For repairs to lock No. 12 on the Ohio river, Pittsburgh federal engineers are taking bids on approximately 25 tons of steel buckle plates and bids will be opened June 12 on 44 small pontoons for Vicksburg, Miss., requiring about 650 tons of plates. American Bridge Co., Pittsburgh, will soon begin work at Ambridge, Pa., on repairs to another lot of Carnegie Steel Co. coal barges, requiring 750 tons of plates.

Cleveland—Plate specifications are improving as time approaches for completion of second quarter contracts. Miscellaneous requirements constitute most of demand, with large projects lacking. Fairport, O., has completed financing arrangements and in a few days will call for bids on an elevated water tank and 3500 feet of fabricated steel pipe, taking a total of 300 tons of plates.

Chicago—Plate requirements for penstocks for federal dams in western states will be up for bids soon and involve fairly large tonnages. TVA is awarding 570 tons for a penstock for the Tennessee dam. Plate demand elsewhere is fairly steady, principally for miscellaneous use. Moderate lots are being taken by railroads and equipment builders. Plates continue 1.90c, base.

Boston—Plate consumers are taking in fair shipments against expiring second quarter contracts, with demand well diversified. An increasing volume of small spot orders at 1.95c, Coatesville, Pa., is being placed for miscellaneous requirements, although little third quarter contracting has been done at that price.

New York—Specifications for steel plates are spotty, although the volume is well sustained. Expiration of protections on identified projects is resulting in the award of a number of small tank tonnages. Word has been received here that the navy has approved plans for 24 vessels, including four cruisers for which funds already have been approved. The remainder include 14 destroyers, six submarines for which funds are likely to be made available before congress adjourns.

Philadelphia—Plate production has undergone further expansion in this district, with one producer putting on his 112-inch mill for the first time since last year, when it was operated for only a brief period. Producers look for the peak of operations during the next ten days. Third quarter contracting is expected to get under way slowly, with the market 1.95c, Coatesville, Pa., or 2.03½c, Philadelphia.

Contracts Placed

1250 tons, 10 pressure tanks, Atlantic Refining Co., Philadelphia, to the Downingtown Iron Works, Downingtown, Pa.

570 tons, penstock, Norris dam, Tenn., for TVA to Chicago Bridge & Iron Works, Chicago.

375 tons, plates, shapes and sheets, as follows: 175 tons of steel plates; 95 tons of structural shapes; 85 tons of wrought iron plates; and 20 tons of sheets, for one twin screw diesel-driven towboat for army engineers, Vicksburg, Miss., to Marietta Mfg. Co., Pt. Pleasant, W. Va.

325 tons, 1,000,000-gallon tank and 150,000-gallon gravity, state farm, Bridgewater, Mass., to Chicago Bridge & Iron Works, Chicago.

300 tons, 1,000,000-gallon water tank, to Thomasville, N. C., to Chicago Bridge & Iron Works, Birmingham, Ala. Pipe to be awarded through Fiske-Carter Co., Spartansburg, S. C. L. S. Bradshaw, Salisbury, N. C., has contract for tank foundation.

196 tons, west coast navy yards, schedule 2339, to unnamed interests.

125 tons, three tanks, Gulf Refining Co., Bay City, Mich., to Chicago Bridge & Iron Works, Chicago.

100 tons, shapes and plates, tank at state reformatory, Concord, Mass., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

7000 to 17,000 tons, San Francisco bay crossing pipe line, Hetch Hetchy project, San Francisco; bids June 11.

650 tons, 44 pontoons for Vicksburg, Miss., engineers, each 48 x 18 x 2 feet 10 inches; bids June 12.

300 tons, elevated water tank and 3500 feet of fabricated steel pipe, mainly 24-inch, Fairport, O.; financing completed and specifications being prepared for early bidding.

250 tons, 1,000,000-gallon water tank

with overflow line 125 feet above top of foundation, Rocky Mount, N. C.; bids June 14; William C. Olsen, Raleigh, consulting engineer.

Unstated tonnage, 75,000-gallon elevated tank on 100-foot tower, Summerton, S. C., Ryan Engineering Co., Columbia, S. C., Engineers; bids June 14.

Unstated tonnage 75,000-gallon elevated tank on 100-foot tower, Holly Hill, S. C.; Ryan Engineering Co., Columbia, S. C., engineers; bids June 15.

Unstated tonnage, steel water tank, veterans' hospital, Los Angeles; Chicago Bridge & Iron Works, Chicago, low at $10,450; bids to veterans' administration, Washington, May 29.

Sheets

Sheet Prices, Page 64

Pittsburgh — At a strong 70 per cent of capacity, sheet mill operations are showing further gains, this being caused by efforts to ship all second quarter orders by July 1. Because capacities are completely booked on certain grades of sheets, a few small sales of sheets at the advanced prices have been made in the market here for delivery in July. Although some sellers opened third quarter books June 1, others delayed until June 11. The market is 2.65c, Pittsburgh, for black sheets; 3.25c for galvanized; 2.00c for No. 10 gage hot-rolled; and 2.55c and 3.15c for No. 10 and No. 20 cold-rolled, respectively.

Cleveland—Sheetmakers in this district expect to ship practically all of the remaining tonnage due on second quarter contracts this month, including automotive, provided labor difficulties do not intervene. Specifications from automobile manufacturers were lighter during the week, mainly because they had previously given mills releases for June shipments. The Fisher Body Corp. here ordered considerable material. A nearby lake sheet mill interest, the bulk of whose output goes to the automotive industry is operating as close to capacity as possible. Contracting has not begun for third quarter. Sellers look for the open-price provision in the revised steel code to exert a stabilizing effect, even if reductions are no longer subject to group sanction.

Chicago — Sheet production remains near capacity and mills are unable to accept additional business for delivery this month in practically all grades and sizes. Consumption is declining in some industries, but the sharp advance in prices is stimulating shipments. Third quarter business so far is light.

Boston—Sheet specifications are slightly heavier. While June probably will be the best month of the quarter, with few exceptions buyers have not accumulated much stock to carry into the third quarter. Little buying has been done at the higher prices.

New York — With mill rollings filled for this quarter and little interest in third quarter contracts, sheet sellers are marking time. Contracting for next quarter is expected to develop slowly and perhaps to be the lightest in more than a year, due to revised provisions of the steel code, which becomes effective today, and to the substantial extent to which some buyers have anticipated requirements.

Philadelphia—Sheet sellers in this district are experiencing a sharp decline in activity. Most of them are virtually out of the market for shipment in this quarter and to date have experienced little contracting for next quarter.

Buffalo — Buffalo district sheet mills continue to operate at 90 per cent and have sufficient business at hand to assure a high rate throughout this month.

Cincinnati—Activity in sheet mills of this district tends higher, to make delivery in full on second quarter contracts. Demand from jobbers is heavy, especially for galvanized sheets.

Birmingham, Ala. — Sheet mill operations are steady, but capacity production is not sought. Agricultural sections have not been in market as extensively as anticipated.

Railroads

Track Material Prices, Page 65

Approximately 5000 tons of iron and steel are required in the Pennsylvania railroad opening of June 14. The materials, which represent the railroad's quarterly maintenance requirements, include tool and high speed steel, steel tires, boiler tubes and steel pipe, plates, shapes, bars, billets, sheets, spring steel, strip, wheels and axles, reinforcing bars and wire nails; also pig iron, piston heads, track spikes, tie plates joint bars, floor plates and sheet piling.

The Pennsylvania closes the same date for a separate inquiry for pipe and tubes for third quarter, not to exceed 150 tons. Other blanket inquiries for third quarter requirements are under consideration by mills.

Rail and equipment buying is lacking, but specifications on previous purchases are being filed steadily.

Gulf, Mobile & Northern has obtained a loan of $210,000 from PWA to cover the cost of 100 freight cars. This road in April placed 150 box cars and 50 gondolas with the American Car & Foundry Co.

Car buying is light, although export inquiry is out for several thousand tons of steel for car construction abroad and substantial domestic car repairs are actively planned. This includes tank car repairs for oil companies.

Seaboard Air Line has taken no action on 1000 box cars for which it has an inquiry, but has awarded ten steel underframes to the American Car & Foundry Co. The Pennsylvania has awarded 500 automobile loading devices in addition to 265 awarded some time ago. The Missouri Pacific has placed 300 of these devices with the Evans Co.

Wheeling & Lake Erie is inquiring for four locomotives and the Aliquippa & Southern for one switcher.

Locomotives Pending

Wheeling & Lake Erie, four locomotives; bids asked.

Aliquippa & Southern, one switcher; bids asked.

Pipe

Pipe Prices, Page 65

Pittsburgh — Supplanting the former discount-off-list method of pricing both hot-finished and cold-drawn seamless carbon steel pressure tubes, is the detailed method of pricing by both per pound and per 100 foot lots of 40,000 pounds or more in 55 cold-drawn sizes in 30 wall thicknesses and 47 hot-finished sizes in 22 decimal wall thicknesses. Shipments of tubular products, especially oil country goods are still heavy although much of the present output is going into consumers' stocks. Pennsylvania railroad closes June 14 on third-quarter tube and pipe needs, not to exceed 150 tons.

Chicago—Chicago has placed 1114 tons of 12 and 16-inch pipe and is taking bids on 103 tons of fittings. While action on pending work elsewhere is being taken more rapidly and there are indications that closing on pipe pending for the past several months will be speeded, orders recently have shown but little improvement. Some municipalities are expected to reject PWA loans and carry out proposed work under their own financing, since some saving can be made under the scale of prices commonly in effect rather than by paying the higher rates prescribed by the works administration.

Boston—Low bid on 19,000 feet,

48-inch pipe, for New Bedford, Mass., with alternates on cast iron, welded steel and reinforced concrete was made by the Lock Joint Pipe Co., Ampere, N. J. at $10.90 a foot for furnishing and laying reinforced concrete pipe. The low for welded steel pipe was $11.70 a foot. The project brought out 11 bidders and should the job go to steel, several thousand tons will be required. Cast pipe buying has declined slightly, but the local foundry is still on double turns.

New York—Except for two projects, taking approximately 2550 tons, the largest at Gloversville, N. Y., on which bids are in, cast pipe inquiry is light. The Burlington, N. J., foundry has been definitely awarded 1050 tons for Oswego, N. Y. Most inquiries are for lots under 300 tons.

Cast Pipe Placed

1114 tons, 12 and 16-inch, Chicago, to Glamorgan Pipe & Foundry Co., Lynchburg, Va.

225 tons, Farmingdale, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

130 tons, 30-inch, Milwaukee, to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, state hospital project, Orangeburg, N. Y., to Donaldson Iron Works, Emaus, Pa.

Cast Pipe Pending

1500 tons, 18 and 20 inch, Gloversville, N. Y.; bids in, Morrell Vrooman, Gloversville, N. Y., engineer.

350 tons, 24-inch and under, Sumter, S. C.; bids June 13, Joseph Palmer, engineer.

200 tons, 8 and 12-inch with fittings, New York city; bids June 14.

200 tons, 6 and 8-inch with fittings, Canadian, Tex.; bids June 19, J. H. Gehbrauer, engineer.

150 tons, miscellaneous requirements of pipe and tubes during third quarter for Pennsylvania railroad, Philadelphia; bids June 14.

103 tons, fittings for 3 to 24-inch pipe, Chicago; bids June 13 to commissioner of public works.

Unstated tonnage, water pipe tunnel under Saugus river, Lynn-Revere, Mass.; general contract to C. J. Maney Co. Inc., Boston.

Steel Pipe Pending

Unstated tonnage, 19,000 lineal feet, 48-inch force main, New Bedford, Mass.; Oak Hill Contracting Co., New York, low on welded steel pipe; Lock Joint Pipe Co., Ampere, N. J., low on reinforced concrete alternate.

Tin Plate

Tin Plate Prices, Page 64

Pittsburgh—The average of tin plate mill operations declined 10 points last week to 70 per cent. Drouth conditions, especially in the Midwest, are causing canmakers in that district to revise their estimates of tin plate requirements. It is expected that the pea pack and others will be 50 to 55 per cent below the volume of a year ago. The market on standard coke tin plate holds at $5.25 per base box, Pittsburgh, and tin mill black sheets at 2.85c, Pittsburgh.

New York—Tin plate sellers report a further slackening in specifications, both for domestic and foreign account. Advance in prices for export tonnage may be attributed in a measure to the slower export movement. It is estimated that over the past month export prices on tin plate have been advanced in the aggregate by manufacturers about 20 cents per base box.

FOR multiple difficulties in fabrication, nothing quite equals the eccentric shaft of a refrigerator.

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COLD DRAWN STEEL BARS • SHAFTING • SCREW STOCK • ALLOY STEELS

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Shapes

Structural Shape Prices, Page 64

Pittsburgh—Bids have been taken by the Erie railroad on two bridges, one 1000 tons at Buffalo, and the other 500 tons at Callicoon, N. Y. About 1000 tons are pending for lookout towers at various locations for the department of agriculture. The market on plain structural shapes continues 1.85c, Pittsburgh, and steel sheet piling since June 11 is quoted 2.15c base, Pittsburgh.

Youngstown Sheet & Tube Co. momentarily is expected to award a tonnage for a new strip mill building at Struthers, O., although the amount may be reduced from its inquiry for 5000 tons of shapes.

Cleveland—Fabricators are figuring a larger tonnage of structural shape projects with a considerable amount still pending for Erie railroad bridges on which bids recently were submitted. A Cleveland contractor is low for the general contract for the 1800-ton Rundel Memorial building, Rochester, N. Y. For a glue manufacturing plant in Woburn, Mass., 515 tons of shapes were purchased here during the week, and 340 tons were awarded for a Pere Marquette railroad car ferry bridge at Detroit. The Ohio highway commission is taking bids June 19 on five bridges requiring a total of 350 tons.

Chicago—Structural awards consist principally of state bridges, with this work also predominating in new inquiries. Orders remain to be placed for federal dams in Oregon and Washington requiring nearly 10,000 tons of shapes. Jacksonville, Fla., engineers have placed 920 tons of piling for a dike there. Inquiries include 2275 tons of shapes for state highway bridges in Arkansas, and 1410 tons for Texas bridges.

Boston—Awards are light. Considerable fabrication is going to shops outside the district. Fabricators are not buying plain material much beyond immediate needs.

New York — New structural requirements continue light, but include about 1600 tons for work in Jersey City, one job being a state armory. As previously announced additional structural steel has been released for fabrication for Rockefeller center, but the total will be close to 22,500 tons, instead of 2500 tons as recently reported.

Philadelphia—Placing of 3300 tons of shapes and 1500 tons of piling for the high-speed line bridge approach at Camden, N. J., leaves about 1300 tons of state bridge work, on which bids are to be opened June 15. Third quarter contracting has not become active. Producers are quoting 1.95c, Bethlehem, or 2.05½c, Philadelphia, for plain material.

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BRONZE DIE CASTING COMPANY
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PITTSBURGH

Shape Contracts Placed

4800 tons, including 1500 tons of steel piling, high-speed line approach work,

Shape Awards Compared

	Tons
Week ended June 9	14,705
Week ended June 2	9,436
Week ended May 26	14,285
This week in 1933	5,809
Weekly average for 1933	15,413
Weekly average, 1934	16,927
Weekly average, May	19,866
Total to date, 1933	354,977
Total to date, 1934	406,264

Camden, N. J., placed through Triest Contracting Corp., New York; shapes to the McClintic-Marshall Corp., Bethlehem, Pa.; piling to Kalman Steel Corp., Bethlehem, Pa.; 340 tons of reinforcing bars also were placed with this latter company.

920 tons, piling, dike, by United States engineers, Jacksonville, Fla., to Inland Steel Co., Chicago.

800 tons, Broadway tunnel, Oakland, Calif., to Moore Drydock Co., Oakland.

645 tons, municipal building, Pawtucket, R. I., to Bethlehem Fabricators Inc., Bethlehem, Pa.; LaChappelle & Salisbury, Pawtucket, general contractors.

600 tons, bridge, Wilmar, Minn., to Minneapolis-Moline Power Implement Co., Minneapolis.

515 tons, building for Flake Glue Co., Woburn, Mass., to Carnegie Steel Co., Pittsburgh; through The Austin Co., Cleveland, contractor-fabricator.

430 tons, freight sheds, Pennsylvania railroad, Thirtieth street, Philadelphia, through Franklin Harris, Philadelphia, to McClintic-Marshall Corp., Bethlehem, Pa.

400 tons, Kress store, 6608 Hollywood boulevard, Los Angeles, to McClintic-Marshall Corp., Los Angeles.

350 tons, bridge, Albert Lea, Minn., to McClintic-Marshall Corp., Bethlehem, Pa.

310 tons, state highway bridge, Miller, Mich., to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, bridge, Corsicana, Tex., to Virginia Bridge & Iron Co., Roanoke, Va.

290 tons, lookout towers, various locations, for department of agriculture, Washington, to Aermotor Co., Chicago.

285 tons, high school, Dobbs Ferry, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.; George A. Fuller Co., New York, general contractor.

275 tons, bridge, NRS 712F, Anderson-Freestone counties, Texas, to Austin Bros., Dallas, Tex.

275 tons, bridge, Okfuskee county, Oklahoma, to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

275 tons, bridge, Crawford county, Arkansas, to Kansas City Structural Steel Co., Kansas City, Mo.

260 tons, bridge for Southern Pacific railroad, Truckee, Calif., to American Bridge Co., Pittsburgh.

250 tons, bridge, Naperville, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

250 tons, bridge, Donovan, Ill., to American Bridge Co., Pittsburgh.

250 tons, Engineering building, University of Virginia, Charlottesville, Va., to Northeast Construction Co., Winston-Salem, N. C.

225 tons, bridge, Jackson county, Missouri, to Kansas City Structural Steel Co., Kansas City, Mo.

210 tons, New York state highway bridge, Greene, N. Y., to Fort Pitt Bridge Works, Pittsburgh.

200 tons, shapes and joists, high school, Alexandria, Va., to Alexandria Iron Works, Alexandria, Va., and Truscon Steel Co., Youngstown, O.

190 tons, 60-foot through plate girder span, Hudson, Wis., to Worden-Allen Co., Milwaukee.

185 tons, bridge No. 854-J, Stonewall county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

175 tons, municipal building, Dover, N. H., to Eastern Bridge & Construction Co., Worcester, Mass.

165 tons, Moss Bluff bridge, No. 1905-A Unit 1, Louisiana, to Jones & Laughlin Steel Corp., Pittsburgh.

160 tons, state highway bridges in Cullman county, Georgia, to Virginia Bridge & Iron Co., Roanoke, Va.; W. F. Scott, Thomasville, Ga., general contractor. Dudley Bar Co., Birmingham, Ala., awarded 53 tons of reinforcing bars.

150 tons, bridge, Sevier county, Arkansas, to Illinois Steel Bridge Co., Jacksonville, Ill.

135 tons, bridge, Tickfaw river, Livingston parish, Louisiana, to Jones & Laughlin Steel Corp., Pittsburgh. G. P. Hopkins, Gulfport, Miss., general contractor.

125 tons, stadium at state fair grounds, Prescott, Ariz., to Allison Steel Mfg. Co., Phoenix, Ariz.

105 tons, factory addition, G. W. Bollman Co., Adamstown, Pa., to Reading Steel Products Co., Reading, Pa.

100 tons, 150-foot truss span bridge, section 126C, Randolph county, Illinois, to St. Louis Structural Steel Co., East St. Louis, Ill.

100 tons, building for Oldsbury Chemical Co., Niagara Falls, N. Y., to R. S.

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SOAKING PIT CRANES
STEAM HAMMERS
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McManus Steel Construction Co., Buffalo.

Shape Contracts Pending

4000 tons, transmission towers for Tennessee valley authority, Washington.

2500 tons, high school, Bayside, N. Y.

2450 tons, main spillway dam at Bonneville, Oreg.; general contract to Columbia Construction Co., Reno, Nev.

2275 tons, state highway bridges Arkansas.

2200 tons, M street bridge over Sacramento river, Sacramento, Calif., for state; bids June 27.

1800 tons, Rundel Memorial building, Rochester, N. Y.; Hunkin-Conkey Construction Co., Cleveland, low for general contract.

1580 tons, state bridge at Deception Pass, Wash.; bids June 19 at Olympia, Wash.

1410 tons, state highway bridges, Texas.

1100 tons, bottling plant at Saratoga Springs, N. Y.; Saxton & Co., New York, low for general contract.

1000 tons, state armory, Jersey City, N. J.; bids June 21.

1000 tons, railroad bridge, Buffalo, for Erie railroad, Cleveland; bids received.

1000 tons, lookout towers, various locations, for department of agriculture, Washington.

900 tons, west approach to viaduct, Vicksburg, Miss., for Vicksburg Bridge & Terminal Co.

800 tons, auditorium for Oberlin college, Oberlin, O.

675 tons, state highway bridge, Winneconne, Wis.; bids June 14.

650 tons, state prison, Bordentown, N. J.; bids rejected. Date for retaking bids uncertain.

600 tons, building, St. Peters' college, Jersey City, N. J.; bids June 12.

600 tons, grandstand, San Mateo, Calif.; McClintic-Marshall Corp., San Francisco, low.

575 tons, state highway bridges, Iowa.

500 tons, 17 cranes, on specification 571, Boulder dam, Boulder City, Nev.; bids June 18.

500 tons, railroad bridge, Callicoon, N. Y., for Erie railroad, Cleveland; bids received.

400 to 600 tons, auditorium, San Jose, Calif.; bids soon.

350 tons, five state bridges in Ohio, including Portage, Madison, Williams, Trumbull and Fayette counties; bids June 19 to state highway commission, Columbus, O.

320 tons, department store building, Hazelton, Pa., for Deisroth Co.; bids rejected.

300 tons, Indiana state highway bridges; bids June 12.

300 tons, Missouri state highway bridges.

300 tons, school, Wolcott, N. Y.; bids June 11.

220 tons, state bridge, over Sacramento river at Redding, Calif.; bids June 13.

200 tons, bridge, Winters Run, Harford county, Maryland; Forbes-Murphy Construction Co., Baltimore, low for general contract at $45,831.

200 tons, estimated, plant for the Miller Casket Co., Washington; bids June 9.

150 tons, school, Johnson City, N. Y.; W. E. Irish Co., Syracuse, N. Y., low.

130 tons, Henry Clay high school, Lexington, Ky.; W. B. Catching Co., Lexington, general contractor.

105 tons, school, Endicott, N. Y.; Knowlton Construction Co., Binghamton, N. Y., low.

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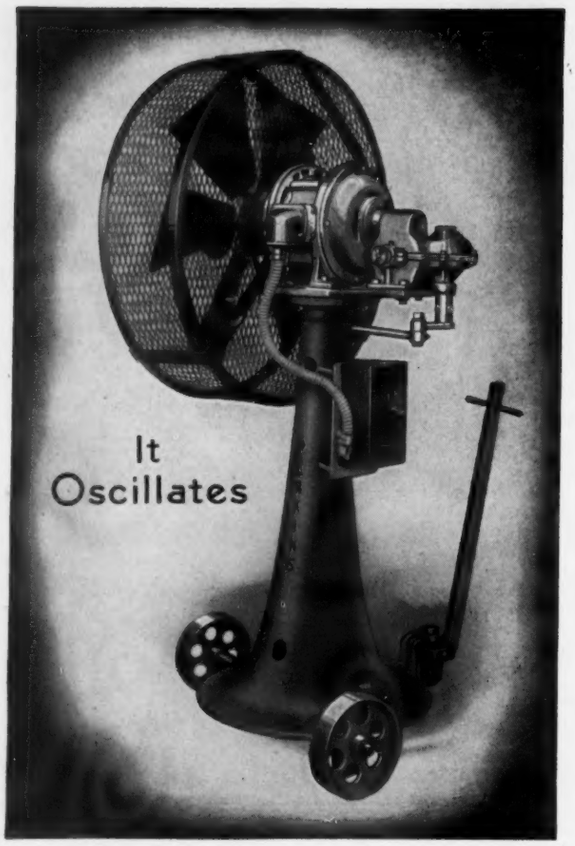

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Metallurgical Coke

Coke Prices, Page 65

No indication is given of any early change in the market on a Connellsville, Pa., oven basis for beehive furnace or foundry coke. Furnace coke remains unchanged at $3.85 with a 25-cent allowable deduction for 12-month contracts. Foundry coke is quoted $4.60, ovens, for common grades, and $5.35 for premium brands. No allowable deduction is permitted on the latter. Coke buying in all three grades is noticeably downward.

Shipments of foundry coke at Chicago is declining gradually as foundry operations become less. Prices continue $8.50, ovens, for outside delivery and $9.25, Chicago. Birmingham cokemakers have taken few contracts for fall and winter delivery.

Reinforcing

Rinforcing Bar Prices, Page 65

Pittsburgh—Although Pittsburgh bar mills bid on 6000 tons of new billet steel bars for the main spillway dam at Bonneville, Oreg., it was reported last week that Pacific Coast Steel Corp., Seattle, had been awarded the contract. Award is expected momentarily on an additional 6000-ton order for bars for the Boulder dam, on which bids were taken April 26. Distributors are figuring about 3000 tons of bars for four Pennsylvania state highway lettings June 15. The market holds steady at 2.05c, Pittsburgh, for cut lengths, and 1.90c base for rail steel reinforcing bars.

Cleveland—The market continues quiet, with little new public work developing. Release of 3000 tons for Cleveland's southerly sewage disposal plant, awarded several months ago to a Cleveland fabricator, is expected shortly, government financing details having been cleared up. At Columbus several hundred tons additional have been awarded for a sewage system, with 2200 tons still pending. Sharp competition from a supplier who is not a subscriber to the steel code caused a temporary reduction in rail steel bars. The Austin Co., Cleveland, has a contract to construct a building for the Flake Glue Co. at Woburn, Mass., requiring 400 tons of bars.

Chicago — Reinforcing bar shipments are fairly steady, but new business continues quiet. Awards remain to be made for Illinois road work on which bids recently were opened. An additional letting of several hundred tons will be made in the near future. Private work is developing few inquiries. Prices are unchanged.

Boston—Reinforcing bars are active, with close to 900 tons for bridges and highways in Massachusetts and Connecticut added to pending volume. Building requirements also are heavier.

New York—Inquiry for reinforcing steel bars is heavier. Awards, however, are light. New York city has bids on 1000 tons for emergency work while close to 3000 tons is expected out soon for track covering, New York Central railroad west side, Manhattan.

Philadelphia — Except for about 400 tons of bars required for miscellaneous state bridge and road work, on which bids are to be opened June 15, little reinforcing bar tonnage is pending here. A few miscellaneous jobs are noted in southern New Jersey. Billet steel bars in cut lengths are 2.05c, Pittsburgh, or 2.34c, Philadelphia.

Reinforcing Steel Awards

6000 tons, main spillway dam, Bonneville, Oreg., to Pacific Coast Steel

Concrete Awards Compared

	Tons
Week ended June 9	9,677
Week ended June 2	2,150
Week ended May 26	3,257
This week in 1933	2,602
Weekly average for 1933	3,771
Weekly average, 1934	4,977
Weekly average, May	4,633
Total to date, 1933	71,123
Total to date, 1934	119,443

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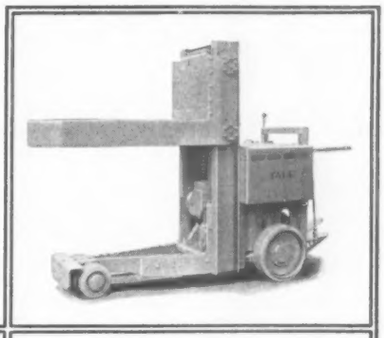

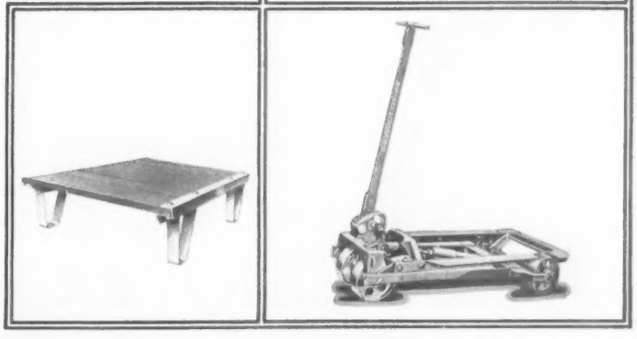

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Makers of Yale Electric Trucks, Hand Lift Trucks, Hand Chain Hoists, Electric Hoists and Trolleys.

Corp., Seattle, through United States engineers, Portland, Oreg., on bids of May 25.

2210 tons, Broadway tunnel, Oakland, Calif., to Pacific Coast Steel Corp., San Francisco.

340 tons, high-speed line bridge approach work, Camden, N. J., placed through Triest Contracting Corp., New York, with Kalman Steel Corp., Bethlehem, Pa.

235 tons, two state highway projects in Los Angeles county, California, to unnamed interests.

200 tons, opening for Panama canal, to Jones & Laughlin Steel Corp., Pittsburgh.

150 tons, Chemistry hall, Washington State college, Pullman, Wash., to Pacific Coast Steel Corp., Seattle; A. F. Mowatt, Seattle, general contractor.

142 tons, race track, San Mateo, Calif.; to Soule Steel Co., San Francisco.

100 tons, Illinois state road work, to Concrete Steel Co., Chicago.

100 tons, bridge, Griffith, Ind., to Concrete Steel Co., Chicago.

100 tons, bridge, New York Central railroad, Palmyra, N. Y., to Truscon Steel Co., Youngstown, O., Bates & Rodgers Co., Cleveland, general contractors.

100 tons, state highway work in Fremont county, Colorado, to unnamed interest.

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PROMAL CHAINS

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Reinforcing Steel Pending

5500 tons, proposal 23,140-A, Boulder dam, Boulder City, Nev.; bids opened.

3000 tons, estimated, track covering, New York Central railroad, west side, Manhattan, New York; specifications out soon.

1000 tons, city of New York, buying direct with delivery point at each of five boroughs; bids in.

650 tons, highway Concord-Lincoln, Mass., also by-pass, Concord; B. Perini & Sons, Framingham, Mass., low for both contracts.

400 tons, building for Flake Glue Co., Woburn, ass.; The Austin Co., Cleveland, general contractors.

300 tons, auditorium, San Jose, Calif.; bids soon.

210 tons, highway projects, Mississippi, mainly in Coahoma county; bids June 19 to state highway department, Jackson, Miss.

200 tons, Fourteenth street terminal, port commission, Oakland, Calif.; general contract to K. E. Parker, San Francisco.

200 tons, M street bridge over Sacramento river, Sacramento, Calif.; bids June 27.

185 tons, highway projects, West Virginia, mainly in Harrison and Marion counties; bids June 12.

170 tons, Bayside high school, Queens, N. Y.; bids in June 12 on general contract.

162 tons, state bridge at Deception Pass, Wash.; bids June 19 at Olympia, Wash.

100 tons, courthouse addition, Visalia, California; bids soon.

100 tons, school, Lyndonville, N. Y.; bids in.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 65

Manufacturers expect to announce prices for third quarter within a week or ten days. Makers of cap and machine screws have filed price with their code authority. Stove bolts now come under the machine screw classification. To consumers the discount on them is 75 in packages, and 83 in bulk. The discount to jobbers is 75 and 10 off for packages. Steel machine screws with round, flat, fillister and oval heads take a discount of 40 per cent from the bulk machine screw list of March 17, 1932. Machine screw nuts in bulk take a discount of 40 from the list of March 1, 1933. Steel machine screws in packages are 70 and 10 per cent off to jobbers and 70 off to consumers from the list of April 2, 1928. Steel machine screw nuts in packages are 57½ and 10 off to jobbers, and 57½ off to consumers from the Aug. 16, 1921 list. Bulk prices for steel machine screws apply to 15,000 or more of a kind and size, instead of 5000.

Demand is tapering in most markets and prices are unsteady at Chicago. Jobbers are not covering in volume.

Wire

Wire Prices, Page 65

Pittsburgh—Some wire producers last week booked shipments for third quarter at the higher prices but others deferred opening third quarter books until after June 11. Specifications for merchant and manufacturing wire products are the heaviest in some months, with continued efforts to ship all second quarter contract tonnage by the end of June. The market is quoted, on a Pittsburgh or Cleveland base, $2.60 per keg for nails, 2.30c for plain wire, 2.45c on annealed fence wire, and 2.80c on galvanized fence wire.

Cleveland—Following a bulge in specifications for June shipment received by some leading manufacturers here, tonnage released during the past week dropped slightly. Mill interests have good backlogs for this month and believe shipments will equal, if not exceed those in May, the best month from a tonnage standpoint in several years.

Chicago—Wire demand generally shows no gain and consumption in farm districts is tending downward. Shipments of manufacturers' wire are fairly well maintained, although consumption is declining in some industries, particularly the automotive. Little interest is shown in third quarter contracting.

Boston—While some wire drawing departments will be pushed to complete second contract shipments before July 1, specifications are somewhat below expectations thus far this month. Under the revised steel code Worcester becomes a basing point for wire rods at $40 a gross ton.

New York—Wire producers are now practically out of the market for this quarter on manufacturers' and other wire. Nails are a notable exception, with the deadline likely to be governed only by the time required to deliver the material.

Strip Steel

Strip Prices, Page 65

Pittsburgh—Some strip producers are out of the market for shipment before July 1. Specifications for strip for immediate shipment are steady with little indication of speculative buying. On spot business the market is quoted 2.00c, Pittsburgh, on hot-rolled strip, and 2.80c, Pittsburgh or Cleveland, on cold-rolled strip.

Cleveland—Consumers are specifying liberally on second quarter strip contracts, taking no chances on inability of mills to deliver material before July 1, in view of the advances of $5 to $8 a ton for third quarter. Cold-rolled stripmakers are close to their limit of production for this month, and while no deadline has been set for receipt of specifications some are warning consumers to release material by June 15. No purchasing of importance has yet developed for third quarter.

Chicago—Strip production continues heavy in the completion of old orders, with little tonnage for third quarter shipment. Despite the decrease in requirements of the automotive industry, deliveries are fairly heavy and total shipments this month are expected to show a substantial increase over May. Prices continue 2.10c, Chicago, for hot strip and 2.80c, Pittsburgh-Cleveland, for cold-rolled strip.

Boston — Cold-rolled strip mills generally have orders assuring high

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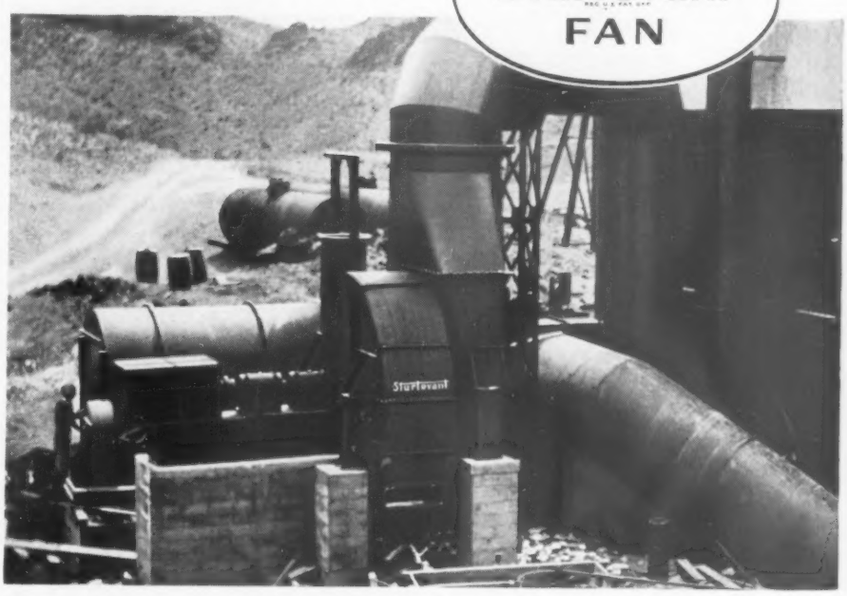

Stress relieving furnace at field pipe fabricating plant of Babcock & Wilcox Co., Boulder Dam. Built by Rust Engineering Co., Pittsburgh, Pa. Flue gas recirculating fan by Sturtevant.

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operations through this month, although last-minute specifications have not materialized in the volume expected. Little business has been done at 3.00c, Worcester, Mass., with indications of a decline in mill operations in July.

New York — Most consumers of steel strip specified fully against second quarter contracts, or nearly so, according to sellers here. Except for some narrow width tonnage, sellers are out of the market for this quarter and hence in good position to analyze the extent to which their customers covered. No third quarter contracting is noted.

Philadelphia—Except for narrow widths, strip producers are unable to book more this quarter. This situation, combined with the fact that third quarter contracting has not as yet set in, makes for dullness. Prices are unchanged, with hot strip at 2.29c, delivered, Philadelphia, and cold at 3.09c.

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Pig Iron

Pig Iron Prices, Page 66

Pittsburgh—The following Neville Island base prices are now quoted for the third quarter. Foundry grades $18.50, basic $18, bessemer $19 and gray forge $17.75. With both merchant furnaces in this district blowing, shipments are heavy against the July 1 expiration of second quarter contracts. Pittsburgh Steel Foundry Co., Glassport, Pa., reopened its Sharon works at Wheatland, Pa., on June 4 with a schedule on steel castings, the first business in three years. The company has two acid open hearths at this works and about 75 men were re-employed. Last week the same company was awarded 60 miscellaneous steel castings for gate operating gears at Galveston, Tex.

Cleveland—Although pig iron producers here opened books for third quarter June 1, no contracts for that period have been booked. Shipments continue to increase moderately, and it is expected that the bulk of the tonnage covered in second quarter contracts will be moved by July 1. Melters are acquiring stocks and a buying movement for third quarter is not anticipated until July. A few spot sales are noted at $18.50 for No. 2 foundry and malleable, base, Cleveland, Toledo and Detroit.

Chicago—A further decrease is noticeable in pig iron consumption, while shipments against old contracts show another gain. Deliveries this month will be substantially heavier than those of May but a sharp letdown is in prospect for July. Some iron under contract is expected to be cancelled, but most consumers are taking shipments in order to avoid the higher prices effective next quarter. Third quarter books are open at $18.50, furnace, for No. 2 foundry and malleable, with new business light.

Boston—Buying has gained slightly with the approach of the end of the second quarter. Shipments are generally in small lots. Consumers are not taking in iron heavily for the third quarter.

New York—Consumers are specifying more heavily, but with actual consumption on the downgrade, indications point to a dull market in July and possibly the greater part of August, with a substantial carryover at the end of this quarter.

Philadelphia—Shipments continue to expand as the deadline for current

quarter contracts is approached. Little or no interest is manifested in third quarter contracts, particularly with most consumers likely to carry over substantial tonnage into July. Under code revisions which become effective June 11, Steelton, Pa., has been made a basing point on several grades, including low phosphorus.

Buffalo—June shipments are starting at a rapid rate with signs pointing to a record volume of business this month. Melt is slowing up in some foundries but purchasers will take out full contracts before the end of the month. Seven blast furnaces continue in production here.

Cincinnati — Shipments against second quarter contracts have accelerated. At the present rate of melt much of this iron will go into inventory, perhaps precluding heavy purchases soon for third quarter needs, unless for protection against further price increases.

St. Louis—June shipments will exceed those of May, although new business is comparatively quiet. Melt in stove plants continues good, these interests filling orders and not building up stocks.

Birmingham, Ala.—While demand has not improved, production of pig iron has increased, output now being about equal to the rate during the first half of 1931. Tennessee Coal, Iron & Railroad Co. has moved a large portion of its several hundred thousand tons of iron ore, mined before the miners' strike began several weeks ago, from the mines to furnaces. Miners sought Governor Miller to prevent removal of this ore, but the governor refused. In May, Alabama produced more than 138,000 tons of basic and foundry iron.

Razing of the old Trussville blast furnace, 15 miles from here, leaves only four obsolete stacks in the state, two at Jenifer and two at Gadsden. Twenty furnaces still are considered potential producers.

Toronto, Ont.—Sales of pig iron are unchanged, with melters showing interest only in immediate needs. Only special grades are being imported from the United States' although it is understood that imports from Great Britain soon will start to come into Montreal.

Coke By-Products

Coke By-Product Prices, Page 65

New York—Distillates continue active with current output going directly into consumption. Demand from lacquer makers for toluol is steady. Prices are unchanged and are listed "until further notice." Naphthalene shipments are active.

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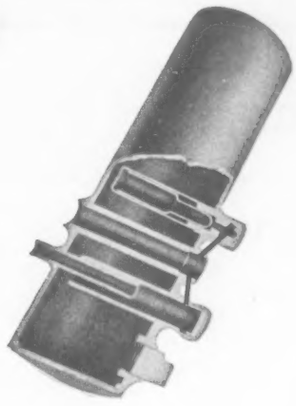

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Scrap

Scrap Prices, Page 67

Pittsburgh—On the basis of a small purchase here by a district mill, orders not exceeding 1000 tons in aggregate, at $11.75, the market on No. 1 heavy melting steel declined 25 cents a ton last week to a range of $11.50 to $12. However, a perplexing situation appeared, as railroad scrap brought $13, delivered, in this district last week, apparently because consumers were trying to avoid rejections. For example, the Baltimore & Ohio sold 1200 tons of No. 1 heavy melting steel at $12.60, delivered to this district and Wheeling, W. Va., and the New York Central is reported to have disposed of heavy melting steel for shipment to Youngstown at $12, both prices realized from dealers. Some indication of the railroad specialties market was also given last week when Baltimore & Ohio couplers and knuckles were sold for $13.80, coil and leaf springs for $13.25, and tires for $13.50, all for Pittsburgh delivery.

Cleveland—Some grades of steel have declined further but most seem to have encountered a resistance point. Shipments on contracts are being taken steadily but new buying seems to be waiting for clarification of the labor situation. An important railroad has decided to hold its scrap accumulation pending better prices.

Chicago — Scrap prices continue easy but in most cases have resisted a further decrease. No. 1 heavy melting steel is nominal at $9.50 to $10, with mills still out of the market. Offerings are fairly liberal but little demand is appearing from any direction, including foundries. A shipment of 4000 tons of borings and turnings is expected to be made soon by water to an eastern port.

Boston—Demand for scrap is dull in New England. The Worcester, Mass., consumer has dropped its price to $7.50 delivered, for No. 1 melting steel, $6.50 for No. 2 and $5.75 for skeleton.

New York—Although heavy melting steel is off 50 cents a ton, other grades are steadier with demand light. For barge loading dealers are now paying $8 for No. 1 and $6.50 for No. 2. Shipments to domestic steel works are light with little new buying. Export trade is less active.

Philadelphia—Despite a reduction in one grade, the scrap market generally is a shade stronger. This may be due in part to belief that important labor disturbances in the steel industry will be averted and in a measure to the fact that prices on some grades have already reached the point where dealers find it more advantageous to hold material than move it at further concessions.

Buffalo — Further weakness in scrap prices, particularly steelmaking grades, is evident. The market is nominal, however, and there have been no tonnage transactions at the new figures.

Detroit — The local scrap market failed to show any further decline since the general cut of 50 cents per ton ten days ago. Local consumer interest is not marked but automotive scrap production has been declining. No. 1 heavy melting steel and hydraulic compressed sheet bundles are unchanged at $8 to $8.50, blast furnace scrap at $5.50 to $6, and machine shop turnings $4.50 to $5.

Cincinnati—Prices on iron and steel scrap are nominal and weak. Little or no distress material is offered. Mills continue to take scrap on contracts.

St. Louis—Steel and iron scrap is quiet and prices are unchanged. Melters are awaiting the turn of events. Sheffield Steel Corp., which has started operations in part of the plant of the Scullin Steel Co., here, has bought 1500 tons of heavy melting steel.

Birmingham, Ala.—Heavy melting steel is not finding much demand. No. 1 cast and other grades are a little active and some tonnage is moving.

Toronto, Ont.—New business in iron and steel scrap is at the average of the past few weeks, but no large tonnage or future contracts have been closed. Current demand is specialized. Foundries are the principal buyers and a steady demand is reported for cast scrap.

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Warehouse

Warehouse Prices, Page 68

Pittsburgh—One week of June has shown warehouse sales locally to be under the same period of May from the standpoint of total tonnage, despite some speculative warehouse buying by customers fearing a steel strike. Prices are unchanged, with no revision expected in cold-drawn bars at 3.45c now that the mill base has been extended into third quarter.

Cleveland—Volume of warehouse business this month shows little change from the comparable period in May. Some sellers note slight improvement in number of orders. Warehouse interests are studying the new detailed method of quoting boiler tubes, as adopted by manufacturers, preparatory to announcing corresponding changes for warehouse sales.

Chicago—Sales are well maintained and continue moderately

heavier than a year ago. Sheets are the most active product, with large shapes and plates moving slowly. Prices are unchanged.

New York—Numerous small orders continue to maintain warehouse volume. Buying is well spread, with prices firm on most products.

Detroit—June specifications for warehouse steel products have been in a slight decline but the trend is regarded as seasonal. Prices are unchanged.

Cincinnati—Demand from warehouses continues fairly steady with no seasonal shrinkage in volume so far apparent.

Nonferrous Metals

Nonferrous Metal Prices, Page 66, 67

New York—Sentiment improved in the nonferrous metals last week on a spurt in domestic copper buying and heavy sales abroad. Lead also was more active. Tin prices jumped on a strength in sterling and a rise abroad. Strike threats continued a depressing factor.

Copper—The industry continued to work on clarification of its code. Problems involved are largely regarding sales arrangements. Whether the government imposed marketing section of the code will be dropped is uncertain but it may be revised in view of the latest pronouncements of the NRA to the effect that price fixing henceforth is to be banned in all codes not yet approved and must conform to new rulings in codes already in existence. Late in the week the market appeared strong. Some sellers filed ½-cent increases effective June 9. bringing electrolytic up to 9.00c, Connecticut.

Lead—The code for the industry went into effect June 4 without the complicated features of that for copper. No price fixing or control of production are included. Demand was in fair volume but was not well distributed among all sellers. Prices maintained a steady appearance.

Zinc—Prices eased on slow demand and heavy production in the Tri-State ore district. Metal shipments in May, however, were the heaviest in months and stocks in the hands of producers fell more than 4600 tons.

Antimony—Prices again slipped below the 8-cent level. Demand was quiet.

Tin—Spot Straits metal jumped to 52.50c Thursday but eased somewhat later due to weakness in sterling exchange. Governments participating in the tin restriction scheme have agreed to form a pool of about 8000 tons for the purpose of stabilizing prices. Production is being increased 5 per cent to provide the metal.

Aluminum—No further change developed in secondary ingot following the ½-cent cut last week. Demand was slower.

Cold Finished

Cold Finished Prices, Page 65

Pittsburgh—Revision in turned and ground shafting prices is in prospect, and they may soon be quoted on the 2.10c, Pittsburgh, base, plus extras according to size. Specifications and shipments of cold-finished steel bars so far in June are below the comparable May period.

Quicksilver

New York—Quicksilver is easy. While small lots are unchanged at $75.50, a virgin flask, round lots are reported available down to $74.50, or 50 cents under a week ago. The longshoremen's strike on the West Coast is interfering with quicksilver shipments to this district.

Semifinished

Semifinished Prices, Page 65

Semifinished steel shipments to nonintegrated pipe producers, forging shops and small strip and sheet mills continue heavy, but sheet bars for rolling into tin plate have been adversely affected by a slackening in demand for finished plate. The following prices at Pittsburgh are quoted on spot business: Sheet bars, $30; billets, $29; wire rods, $38; skelp, $34; and forging quality billets, $34.

Ferroalloys

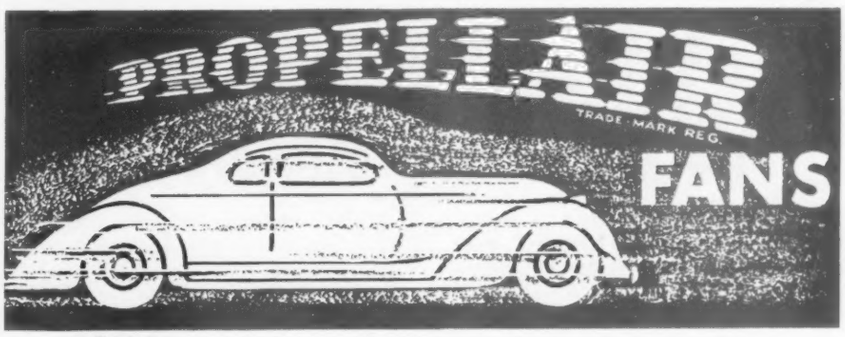
Ferroalloy Prices, Page 66

Sellers of domestic ferromanganese expect to open books shortly for third quarter at the unchanged price of $85, duty paid, Atlantic and Gulf ports. Spot domestic speigelsen, 19 to 21 per cent, may be reaffirmed at $26, furnace, but a final decision will not be made for a few days. No prices have yet been filed for the new Chicago base.

Iron Ore

Iron Ore Prices, Page 66

Cleveland—Consumers of Lake Superior iron ore who have not covered fully for their season's requirements indicate they will wait until after labor uncertainties have been cleared away before they make further purchases. Shipments from upper lake ports in May totaled 2,630,578 tons, compared with 900,534 tons in the month last year.



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PROPELLAIR, INC., SPRINGFIELD, OHIO

Pacific Coast

Pacific Coast Prices, Page 65, 66, 68

San Francisco—(*By Air Mail*)—Bids have been called for the San Francisco bay crossing of the Hetch Hetchy pipe line from San Francisco, requiring 7000 to 17,000 tons of plates. Bids will be opened June 11. Awards include 2210 tons of reinforcing bars for the Broadway tunnel, Oakland, Calif., placed with the Pacific Coast Steel Corp., and 2065 tons of structural shapes for the Yaquina Bay bridge, Newport, Oreg., booked by the Virginia Bridge & Iron Co., Roanoke, Va. Demand is holding up well.

Soule Steel Co. took 142 tons of reinforcing bars for a race track at San Mateo, Calif. Unnamed interests secured 253 tons for two highway projects in Los Angeles county, California. Bids have been opened on 5500 tons for Boulder dam, Boulder City, Nev., under proposal 23,-140-A.

Moore Drydock Co., Oakland, Calif., secured 800 tons of structural shapes for the Broadway tunnel in Oakland, Calif. McClintic-Marshall Corp., Bethlehem, Pa., took 400 tons for a Kress store at 6608 Hollywood boulevard, Los Angeles. Allison Steel Mfg. Co., Phoenix, Ariz., was awarded 125 tons for a stadium at the state fair grounds, Prescott, Ariz. Bids will be opened June 27 for M street bridge over the Sacramento river at Sacramento, Calif., and June 18 for 500 tons for 17 cranes which are required for Boulder dam, Boulder City, Nev.

Large Dam Project Let

Seattle — Complete cessation of deep water transportation due to the longshoremen's strike is taking its toll from the iron and steel business of the Pacific Northwest. Supplies have been cut off and buying has been temporarily halted. Closing of manufacturing plants because of the labor troubles is being keenly felt.

The general contract for the main main spillway dam at Bonneville, Wash., has been placed by army engineers with the Columbia Construction Co., Reno, Nev., low bidder at $8,972,650. This is the largest federal job ever awarded in this section. This work calls for 2450 tons of shapes and 6000 tons of reinforcing steel.

Tonnages awarded this week were of minor size but considerable business is soon to be placed. Pacific Coast Steel Corp., Seattle, took 150 tons for Chemistry Hall, Washington State College, Pullman, Wash. Paul Paulsen Co., Pocatello, Idaho, is low at $113,051, for a 11,500,000 gallon reservoir at Pocatello, involving 130 tons of reinforcing cast pipe, valves, etc. P. O. Montgomery, Dallas, Tex., has been awarded the contract for the Fort Peck, Mont., electric distribution system, at $79,-429.

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Steel in Europe

Foreign Steel Prices, Page 68

London—(*By Cable*)—Shipments of steel and iron products from the Tees, in England, in May were the best since April, 1931, representing a steady improvement. In the Middlesbrough district demand is growing. Inquiry from Russia, China and South Africa is quiet. Orders for heavy steel products is increasing, including structurals and steel rails. Activity of pig iron is being maintained in all districts.

The Continent reports some improvement in sales of steel to Great Britain but in the Far East competition from Japan is increasing. Another blast furnace stack is being lighted at Dortmund, Germany.

Labor Survey in Pittsburgh District

(*Continued from Page* 16)

thing less than a fourth were members.

Most of these are Finns, who are clannish and who because the employe representation plan was so much Greek to them, never did subscribe for the company's plan of representation, nor for that matter anything that had to do with the management. Some of the Americans in the mill call the Finns "sore heads."

Joe wants to work. Debts and needs of his family strongly preclude Joe going out on strike the way the Finns are talking, even if he wanted to. Joe doesn't want to. He has no grievance against the wire mill. They helped him out a year ago with a food allowance and some clothes when the sledding was toughest.

AUGUST B—— is on a billet chipping gang at still a third Pittsburgh district steel mill. He was not born in this country, but has lived here most of his life and has held common labor jobs in and around steel mills. His employers say he never has displayed the ability for a foremanship in the billet chipping crew, consequently today he is where he started many years ago. Attempting a conversation with August confirms this.

His attitude toward his employers is, first and foremost, a sour one. He believes, though he doesn't say it, that if the company he works for were to pay him $100 a day some

inborn hatred seems to tell him that if they could pay him $100 daily they must be able to pay him $1000 daily.

He didn't vote for the employe representation plan because, being started by the works' management, it must be discriminatory and he will have none of it. Obviously, he voted against the modification plan of the employe representation idea when it came up a few months ago, just on general principles, he infers.

Hardly able to speak English, still antagonistic toward most of the customs of this country and his company, he seized the first glowing promises of labor organizers ten weeks ago and took out a membership. Dues make quite an inroad monthly into August's modest income, but he has been promised big things when the steel strike is pulled.

JOHN C——is a roller in a plate mill located not so many miles from Pittsburgh's "Golden Triangle." He is an American, well educated, and has been a loyal employe. He is still in his thirties but has 16 years of continuous service with this one steel mill. Outside of his work he is a good citizen in Pittsburgh proper where he lives, and commutes via two street car lines daily each way to the steel mill.

John has been approached unsuccessfully on the union membership idea, but neither is he entirely sympathetic toward some of the things he has heard recently about the management of his own company.

For instance, beng a daily reader of all three of the Pittsburgh daily newspapers, he was startled last winter to read in cold type that the president, vice presidents and most of the general executives were drawing down salaries and bonuses that totaled well over $1,000,000. John reads the financial pages, too, and he can tell you that his company lost money last year—some $8,500,000 all told.

Now, John has met the president of the company he works for and most of the vice presidents. He shook hands with the president one day when they turned out a record tonnage on the plate mill. The operating vice president calls him by name. John knows of the ability of these men, knows it should be repaid. But something sticks in his craw—he can't reconcile those big salaries in years of the company's heavy loss. He has talked it over with his wife; she can't understand it either.

John, though, is wise to the professional labor organizer. He had been with the company only one year when the 1919 trouble fomenters hit the mills. He will have none of their kind, but on the other hand that thought is always in the back of his mind—those big salaries to his company's officers.

When and if the steel strike comes, John no doubt will cast his lot with the management. The employe representation plan at the mill has been functioning well since last June and John sees no need for some outsider stepping in just for a cut of his modest pay.

I AM convinced that there are three distinct classes into which the steelworker falls today.

The first and preponderantly the largest is made up of those men either opposed to or openly antagonistic to attempts of the Amalgamated association or other unions to both unionize workers and strike.

The second group is made up of those with no avowed affiliation, but who may be swayed by the events of the next week. However, this group is basically loyal to its employers.

The third group comprises the Amalgamated's membership itself, openly and avowedly bent on getting union recognition overnight.

Equipment

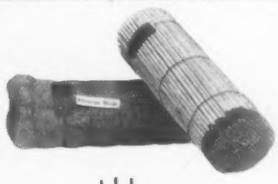
Chicago—A slight hesitancy in demand for certain types of machinery and plant equipment still is evident. This applies principally to sales since inquiries are in fairly steady volume. Some machine tool purchases by steel plants still are held up by lack of approval of requisitions, and developments are lacking in regard to major improvement programs.

Pittsburgh—Threats of a steel strike have caused negotiations for some prospective heavy mill equipment installations to be passed up entirely and in fact to be cancelled on some minor work. For instance, a leading steel mill, dependent upon outside sources for its rolls, issued orders last week holding up all roll work for the balance of June.

New York—Machinery dealers and builders are encouraged by the improved outlook. Several hundred machines will be required for a group of technical schools in New York which have never been equipped due to lack of funds, now available. Specifications, however, are not yet out. There is a better inquiry for heavier equipment in the East and a trend toward more buying of sheet metal working tools, including brakes and shears. Bids are in on equipment for a state hospital machine shop, Brentwood, N. Y., requiring seven tools, including a shaper, milling machine and several lathes.

Boston—While there has been some spotty decline in new orders for machinery, some buying by automotive and parts makers has developed earlier than usual for model changes. Japan has placed 10 machines in the Worcester, Mass., district, including boring mill equipment.

Cleveland—Reports of current business in machinery and equipment reveal a mixed trend. In general there appears to be a slight recession in requests for quotations and in orders, partially attributable to labor difficulties. A screw machine manufacturer, however, reports active sales over a broad group of industries, practically all for replacement. This company looks for good business during the summer and foresees fall sales taxing the capacity of the plant.



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Construction and Enterprise

New York

BROOKLYN, N. Y.—Preferred Oil Co. Inc., Samuel Kobra, president, 95 First street, plans construction of a bulk oil plant with initial capacity of 3,000,000 gallons, including tanks, pumping machinery and auxiliary equipment, to cost about $85,000.

BUFFALO—Barcalo Mfg. Co., 225 Lousiana street, manufacturer of wrenches and tools, has taken larger quarters at 135 Scott street to allow enlarged operations.

NEW YORK—Robinson Connector Co. Inc. has been formed by Cuthell, Hotchkiss & Mills, 20 Pine street, to deal in iron and steel products.

NEW YORK — Johnston Machine Corp. been formed to manufacture machinery and metal products, by Douglas Johnston, 325 East Seventeenth street, New York.

NEW YORK—F. Perlman & Sons Corp. has been organized to take over the interests of F. Perlman & Sons, 94 Pearl street, and to manufacture metal specialties. F. Perlman heads the company.

NEW YORK—Board of education offices at Park avenue and Fifty-ninth street, will include a manual training division in its new high school at Bayside, in Queens. Cost of school is estimated at $2,500,000, partly by federal aid.

New England

BRIDGEPORT, CONN.—Bridgeport Brass Co. will build a 1-story addition, 54 x 130 feet, costing $40,000, with equipment. Fletcher-Thompson Inc., Bridgeport, Conn., is engineer.

EAST HADDAM, CONN.—C. A. Peck Inc. has been organized to operate a machine shop and manufacture a line of machinery, by C. A. Peck, Essex, Conn.

MIDDLETOWN, CONN.—Remington-Rand Inc., 374 Broadway, New York, will build a two-story addition, 99 x 120 feet, at its Remington Typewriter division here, at cost of about $45,000. General contract has been given to H. K. Ferguson Co., Hanna building, Cleveland.

NORWALK, CONN.—Halport P. Hill & Associates Inc., 112 West Forty-second street, New York, is making plans for a client for distillery alterations to a 4-story building, including new distributing equipment and conveyors, to cost about $30,000.

BROCKTON, MASS.—Kenport Inc. has been formed to manufacture electrical machinery, by Charles E. Kennedy and Henry B. Post, 228 Spring street, Brockton, Mass.

Pennsylvania

MIDDLETOWN, PA.— War department, office of constructing quartermaster, Middletown air depot, in addition to other improvements will construct a heating plant, storage houses and officers' quarters. New construction, reconditioning and improvements will involve expenditure of $1,640,976, of which $662,500 will be spent for shop and hangars. (Noted June 4.)

PHILADELPHIA—Container Corp. of America Inc., Nixon and Fountain streets, plans a 1-story addition to its power plant and installation of a 5000-kilowatt turbogenerator unit and auxiliaries. H. M. Wilson Co., Eighteenth and Brandywine streets, is engineer.

WARREN, PA.—United Refining Co. has let contract for new 2000-barrel rerun unit for its Warren, Pa., plant, to Arthur G. McKee & Co., 2422 Euclid avenue, Cleveland, engineers and contractors. The plant will be completed by Sept. 1. (Noted April 16.)

Ohio

ATHENS, O.—Ohio Mining Co. will rebuild its burned units, including its electric powerhouse, at cost of about $75,000.

DAYTON, O.—Brownell Co., 300 North Findlay street, will rebuild its burned boiler and plate shop. Contract has been given the Austin Co., Cleveland. Equipment to be replaced includes a traveling crane. Total cost about $70,000.

New Jersey

ATLANTIC CITY, N. J.—Mack Equipment & Machine Co. has been formed to manufacture machinery and equipment, by William Swinton and Charles H. Luckenbill, 327 North Indiana avenue.

LYNDHURST, N. J.—United Cork Co. will rebuild its burned plant at cost of about $100,000 and will install electric power equipment.

NEWARK, N. J.—Atlantic Sheet Metal Works Inc. has been formed to manufacture sheet metal products, by Frank Bladis and associates. Henry Spielvogel, 24 Commerce street, is company representative.

Michigan

DETROIT—Michigan Scrap Iron & Metal Co. has been incorporated to deal in metals, by Leo Spector, 2980 Sturtevant avenue.

DETROIT—Kelvinator Corp., 14250 Plymouth, has moved its factory service department to the old plant on Fort street to make room for expansion of offices and other departments.

DETROIT—Sale of the Peninsular Stove Co. property at $275,000 to the Detroit Gasket Mfg. Co., 159 East Milwaukee avenue, has been approved by the circuit court. The property consists of buildings and 18 acres of land.

DETROIT—Conrad Keller Co., 4628 Moran, has been awarded general contract for remodeling a Battle Creek, Mich., building into a distillery at an approximate cost of $60,000, for the R. Cummins Co., Louisville, Ky.

FENTON, MICH.—Industrial Machine Tool Co. will rebuild part of plant recently burned, at cost of about $25,000. (Noted May 14.)

JACKSON, MICH. — Manufacturers' Development Co. has been incorporated by Frank W. Gay, Robert L. Kennedy and Don T. McKone. The company, incorporated for $250,000 has taken steps to acquire the plants and properties of the American Fork & Hoe Co., Vulcan Engineering Co. and two other small Jackson manufacturing establishments.

LUDINGTON, MICH.—Lake Shores Distilling Co. has been formed with capital of $50,000 by L. G. Jebavy, Ludington.

MT. CLEMENS, MICH. — Singelyn Brewing Co., with offices in the Lawyers building, Mt. Clemens, is planning to construct a brewery here. The company recently was incorporated with $200,000 capital by A. James Singelyn, 29128 Jefferson avenue, St. Clair, Mich.

PORT HURON, MICH.—Pressed Metals of America is planning to construct a factory addition to cost $25,000. Plans will mature this summer.

Indiana

INDIANAPOLIS—Basca Mfg. Co., 1454 East Nineteenth street, has been formed to manufacture automotive equipment and parts, by Walter M. Bassett and associates.

LAWRENCEBURG, IND. — James Walsh & Co. plans to erect a distillery, including an electric power plant and equipment, to cost about $350,000. Hillsmith & Co., 108 East Third street, Day-

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ton, O., are engineers and contractors.

SOUTH BEND, IND.—Alloy Metal Crafts Inc. has been formed to manufacture metal products, by Edward J. Bouchard.

TERRE HAUTE, IND.—Merchants Distilling Co. plans to build a 1-story powerhouse as part of its program of modernizing its plant, at cost of about $60,000. Walter C. Wagner, Breslin building, Louisville, Ky., is architect.

Illinois

MORTON, ILL.—Beyer Implement Co. has been formed by Michael Beyer and associates, to manufacture agricultural implements.

ROCHELLE, ILL.—Kelmaker Mfg. Corp., 515 Lincoln avenue, has been formed to manufacture pressure filters, by Frank C. Kelley, Rochelle, Ill.

VIENNA, ILL.—City will call for bids in June for a deep well, pumping equipment, steel tank on tower and distributing system, to cost about $60,000. Warren & Van Praag Inc., Decatur, Ill., is engineer.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids June 19, schedule 2705, on automatic welding machines, delivery at Washington; schedule 2706, on four sets of precision gages, delivery Washington.

WASHINGTON — Veterans administration, L. H. Tripp, director of construction, 764 Arlington building, will open bids June 22 for constructing and finishing complete boilers, stokers and boiler plant equipment, for the veterans facility, Aspinwall, Sharpsburg, Pa.

WASHINGTON—United States property and disbursing office, room 102, National Guard Armory, Sixth street and Pennsylvania avenue, northwest, opens bids June 27 for one pump house, including utilities, in accordance with drawings 6712-105 to 6712-110 inclusive, and specification 17-E.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids June 19, schedule 2705, on automatic welding machines; schedule 2706, precision gages, both for delivery at Washington; June 22, schedule 2678, diesel engines and spare parts, delivery at Mare Island, Calif., and Puget Sound, Wash.

Kentucky

JUNCTION CITY, KY.—City will receive bids June 18 for furnishing materials and constructing complete waterworks system. Howard K. Bell, 732 McClelland building, Lexington, Ky., is consulting engineer. (Noted May 7.)

LOUISVILLE, KY.—Selected Kentucky Distillers has been formed by Conger Poage and H. C. T. Whittenberg.

LOUISVILLE, KY.—Schmutz Metal Refining Co. has been incorporated with capital of $30,000 by Julius Schmutz and Ella McClaskey.

South Carolina

HOLLY HILLS, S. C.—Sealed proposals will be received by the town council until June 15 for constructing complete waterworks system, consisting of tank foundation and buildings for deep well pumps, and 75,000-gallon elevated storage tank on 100 foot tower. Ryan Engineering Co., 41 Arcade building, Columbia, S. C., engineer.

ORANGEBURG, S. C.—Palmetto Sash & Door Co. has been formed by James M. Green to operate a woodworking plant.

SUMMERTON, S. C.—Town council will receive sealed proposals until June 14 for constructing complete waterworks system. Contracts will be let in three sections as follows: (A) Water distribution system including pipe lines, valves, hydrants, meters, tank foundation and buildings for deep well pumps; (B) two deep wells and two deep well pumps; (C) 75,000-gallon elevated storage tank on 100 foot tower. (Noted April 9.)

SUMTER, S. C.—City, Joseph Palmer, engineer, will receive bids June 13 for furnishing material and constructing improvements to waterworks and sanitary sewers, consisting of pump and motor for waterworks station, sewage pumping station and filter bed and appurtenances.

Tennessee

DRESDEN, TENN.—Bell Clay Co. is constructing storage houses and loading shed, to be equipped with modern machinery.

MEMPHIS, TENN.—Betsin Bros., 244 Arch street, Philadelphia, plans establishing cap plant in building at 104 South Third street and will operate as Memphis Cap Co. New machinery will be installed.

MEMPHIS, TENN.—Acme Barrel Co., recently organized by Paul F. Gruber, Sterrick building, has leased a site on Riverside boulevard where it will erect plant 40 x 80 feet, with 300 barrels daily capacity.

RIPLEY, TENN.—Ripley Box & Basket Co., A. B. Klutts, secretary, will rebuild burned plant and will install crate machines, basket machines, saws, lathes and all necessary equipment.

SEVIERVILLE, TENN.—City, Roy C. Marshall, mayor, will receive bids until June 20 for water supply and sewer system. Freeland, Robert & Co., Independent Life building, Nashville, Tenn., engineers.

West Virginia

CHARLESTON, W. VA.—West Virginia Steel Corp., which was formed recently, has acquired the iron works of R. J. Coney & Co., and will enlarge and develop its line of production. (Noted May 14.)

WHEELING, W. VA.—Consolidated Expanded Metal Corp., Steelcrete building, subsidiary of Wheeling Steel Corp., will erect a modern new factory building at Beech Bottom, W. Va., soon. The building, 90 x 140 feet, will house various operations in making new products of expanded metal.

Virginia

CHRISTIANSBURG, VA.—Town has voted $72,000 bonds for sewer system

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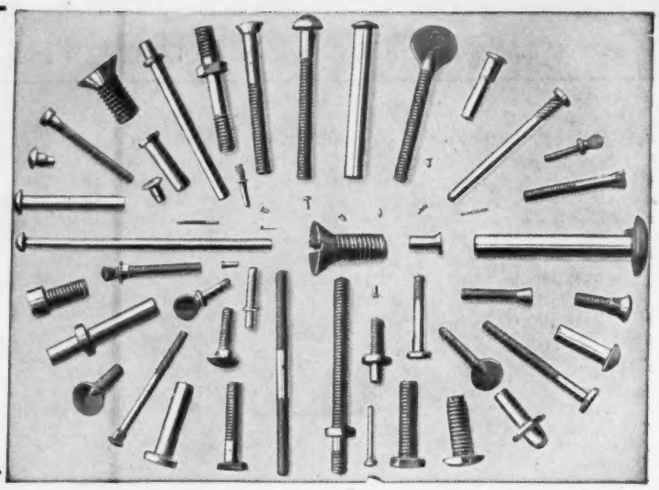

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and sewage disposal plant. Project will cost $100,000, of which $28,000 will be public works grant.

PEARISBURG, VA.—Town, C. E. Lewey, mayor, will receive bids June 15 for furnishing materials and equipment for constructing waterworks and sanitary sewer.

ROANOKE, VA.—Virginia Brewing Co. has let contract to Salem Foundry & Machine Works for mill unit for plant on Wise avenue, southeast. An endless chain conveyor will be installed and $20,000 will be spent on other equipment, including installations of steel tanks, hoppers and brewing devices.

Missouri

MALDEN, MO.—Plant and equipment of the Risco Elevator Co. recently was damaged by fire to the extent of $14,500.

HORNERSVILLE, MO.—City, S. A. Shield, mayor plans waterworks to cost $29,000. Will soon call for bids. A. Fuller Co., 2916 Shenandoah avenue, St. Louis, engineer.

ST. LOUIS—St. Louis Public Service Co. has been granted authority by Federal Judge Davis to spend $1,098,783 to remove and reconstruct certain trackage in city and to purchase operating equipment.

VALLEY PARK, MO.—City plans to install a diesel engine-generator in the municipal waterworks plant. C. Schall is water commissioner.

WAYNESVILLE, MO. — Pulaski Cooperage Co. has been organized to operate a woodworking plant, by O. T. Steudle, 6946 Kingsby, and W. C. Smith, both of St. Louis.

Arkansas

STAMP, ARK.—City, Dr. E. D. Brown, mayor, will receive bids June 14 for furnishing tools and materials and constructing waterworks system; also bids for 270 water meters. Hugh R. Carter, National Standard building, Little Rock, Ark., engineer.

YELLVILE, ARK.—General Mining Corp., J. H. Hand, vice president and general manager, will install electric power equipment in connection with its lead and zinc development, new mill and refinery, about $80,000 being involved. (Noted May 21.)

Oklahoma

GUTHRIE, OKLA.—City votes June 25 on approving $138,200 bonds for installing pumping machinery and other equipment for waterworks improvements.

MUSKOGEE, OKLA.—City may take a vote July 3 on $1,250,000 power and light plant bonds.

Texas

FAIRFIELD, TEX.—City, Harvey B. McAllister, consulting engineer, 714 North Eleventh street, Waco, Tex., will begin constructing waterworks and sewer system as soon as funds are available, including elevated tank and tower, ground storage tank of 100,000-gallon capacity, pumping equipment, etc.

HOUSTON, TEX.—Ajax Well Tool Corp. has been incorporated by Walter L. Church and J. K. Clark, 1524 Maury.

HOUSTON, TEX.—City votes June 16 on $2,500,000 bonds as security for PWA loan for extension and rehabilitation of city waterworks system.

Minnesota

BENSON, MINN.—City council will call bids in June for improvements to the municipal electric light and power plant, including a 350-horsepower boiler unit, superheater, stoker and other accessories, at total cost of about $50,000. Burlingame & Hitchcock, Sexton building, Minneapolis, are engineers.

MINNEAPOLIS — Great Northern Railway, Railroad building, St. Paul, will soon receive bids for erecting a second story-addition to mail and express building at Bridge Square and High street, including installation of new conveyor over High street to connect with new postoffice building. T. D. McMahon, 1215 Railroad building, St. Paul, is company architect.

NEW ULM, MINN.—City plans improvements to municipal power plant to cost $35,000 including installation of two diesel engines. A. C. Sannwald is city clerk.

ST. PAUL—Minneapolis-St. Paul sanitary district, board of trustees, 1923 University avenue, will receive bids until June 18 for three units of joint sewer system to cost $1,000,000. Entire project will cost $18,000,000.

WINONA, MINN.—Louis Thurow Box Factory, Wilson avenue and Third street, has awarded contract to Fred H. Burmeister, for a 1-story box factory addition, 26 x 40 feet.

South Dakota

SIOUX FALLS, S. DAK.—City plans sewage disposal plant addition and alterations to cost $210,000. Bids will be taken on $172,000 bond issue on June 18. Sewage plant will include aeration tank, clarifier, sludge bed and machinery building. Andrew Norsted is city auditor. Pillsbury Engineering Co., 1200 Second avenue, south, Minneapolis, engineer.

Iowa

AMES, IOWA—Mark F. Lindsey has purchased the Ames Machine & Instrument shop and plans extensive changes in the present shop with some additions in the line of new equipment. The new business will specialize in the building and repairing of special machines, tools and instruments.

Kansas

KANSAS CITY, KANS. — Fowler-Straub Packing Co., 100 Meyers street, plans to install power equipment in a 2-story addition to its plant, at total cost of about $28,000. O. J. Barth, National Fidelity Life building, is engineer.

STRONG CITY, KANS.—City council will build a $53,000 muncipal electric light and power plant, including a diesel engine-generator set. E. T. Archer & Co., New England building, Kansas City, are engineers.

WICHITA, KANS.—All-Steel Products Co., 805 South Wichita street, will install electric motors and other power equipment in a 1-story addition, 60 x 120 feet, which it will start soon.

Colorado

DENVER—Bureau of reclamation will receive bids June 18 for 11 traveling cranes, two jib cranes, two stationary hoists and two monorail hoists; specification 571.

Pacific Coast

BERKELEY, CALIF.—San Francisco Sulphur Co., 836 Henry street, is building an addition to its plant to cost about $30,000.

COALINGA, CALIF.—Stroud Bros. & Seabrooke, Union avenue, Bakersfield, Calif., have contract from the city council for a complete sewage treatment plant.

EL SEGUNDO, CALIF.—Northrop Corp., a subsidiary of Douglas Aircraft Co. is building an addition to its airplane manufacturing plant, to cost about $35,000.

LONG BEACH, CALIF.—Shop building of the Woodrow Wilson high school will be reconstructed. Horace Austin is architect.

LONG BEACH, CALIF.—A new shop and warehouse building will be erected at Pine avenue and Willow street at an estimated cost of $70,000. Roger K. Nissen and William Kenneth Webb are architects.

LOS ANGELES—Western Blind & Screen Co., 2700 Long Beach avenue, will rebuild its burned plant and install electric power equipment, at total cost of about $65,000.

OILDALE, CALIF.—Union Oil Co. of California, 220 Bank street, San Francisco, has made surveys for a 14-mile pipeline from the Weed Patch oil field to its refinery here, to cost about $125,000.

SAN DIEGO, CALIF.—Balboa Brewing Co. has bought the property of the Mathie Brewing Co., Antonio and North Main streets, and will spend $1,000,000 for a new plant and equipment.

SAN FRANCISCO—Wieland Brewery, 240 Second street, Herman Noethit, engineer, will enlarge and improve its brewery and install an electric power plant, at cost of about $125,000.

PORTLAND, OREG.—John E. Benson, 1183 East Nineteenth street, has leased plant formerly occupied by the Harrison Foundry & Machine Co., 525 North Twenty-eighth street, and has opened for business under the name of American Iron Works. The company will specialize in alloy iron castings and railroad car brake shoes.

BELLINGHAM, WASH. — Natural Hard Metal Co. of America Inc., has been organized with $50,000 capital by R. W. Green and associates, 222 Bellingham National Bank building.

HOQUIAM, WASH.—Polson Logging Co. and affiliated interests will extend their Ozette railroad about 30 miles north to the Hoh river, Olympic peninsula. The road will be a common carrier and will take the place of the proposed Northern Pacific-Union Pacific extension planned in 1929 but postponed. Actual work awaits agreement with the Indians for right of way and sale of their timber.

SPOKANE—Calkins Mfg. Co., 1022 Atlantic street, has been incorporated with capital of $25,000 to engage in the manufacture of farm machinery.

TACOMA, WASH. — Independent Breweries Inc. is building a 3-story mill-type plant, 70 x 116 feet at 5624 McKinley avenue. Separate contracts will be awarded boiler and engine plant.

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Edward S. Lawrence

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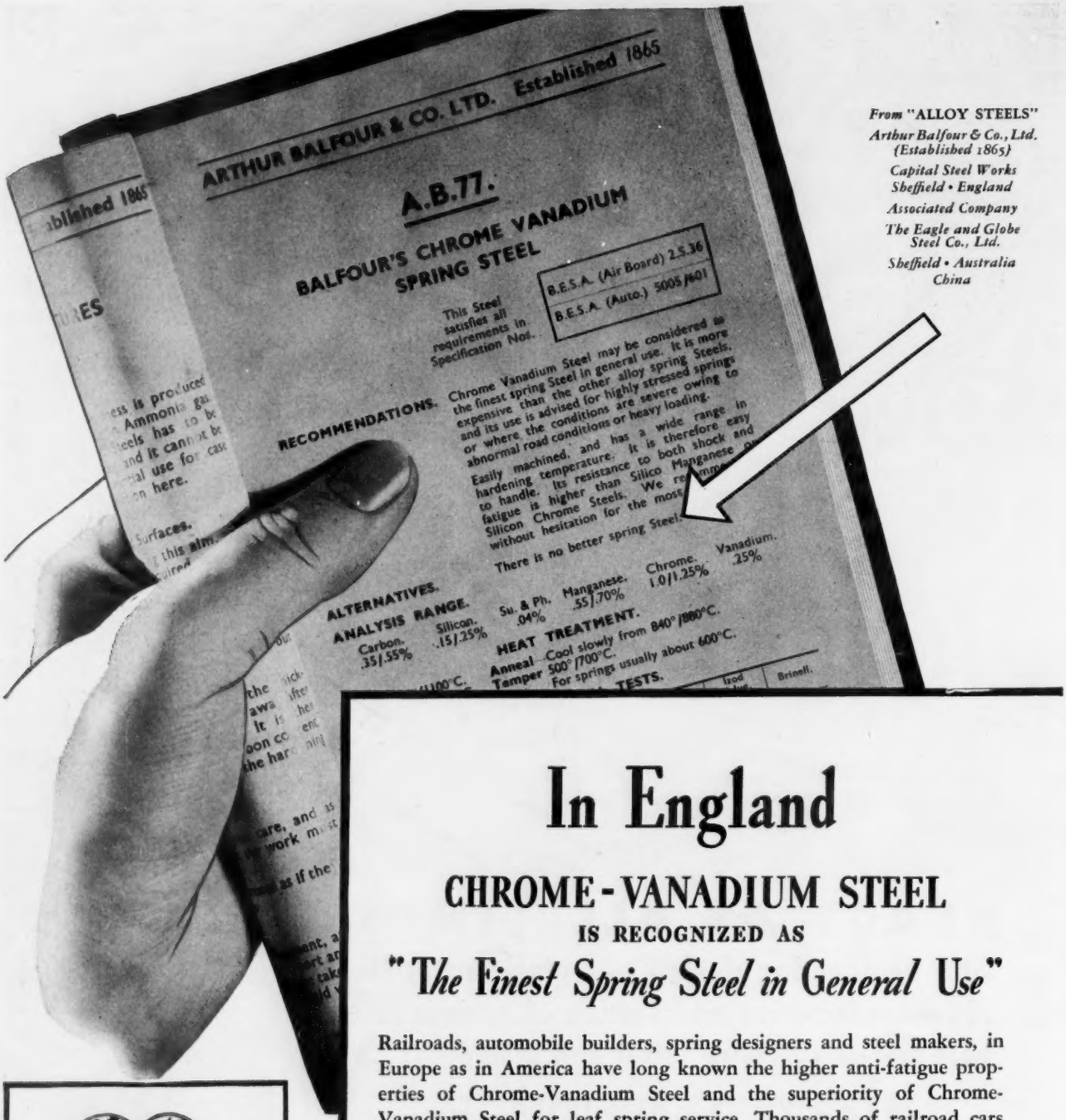
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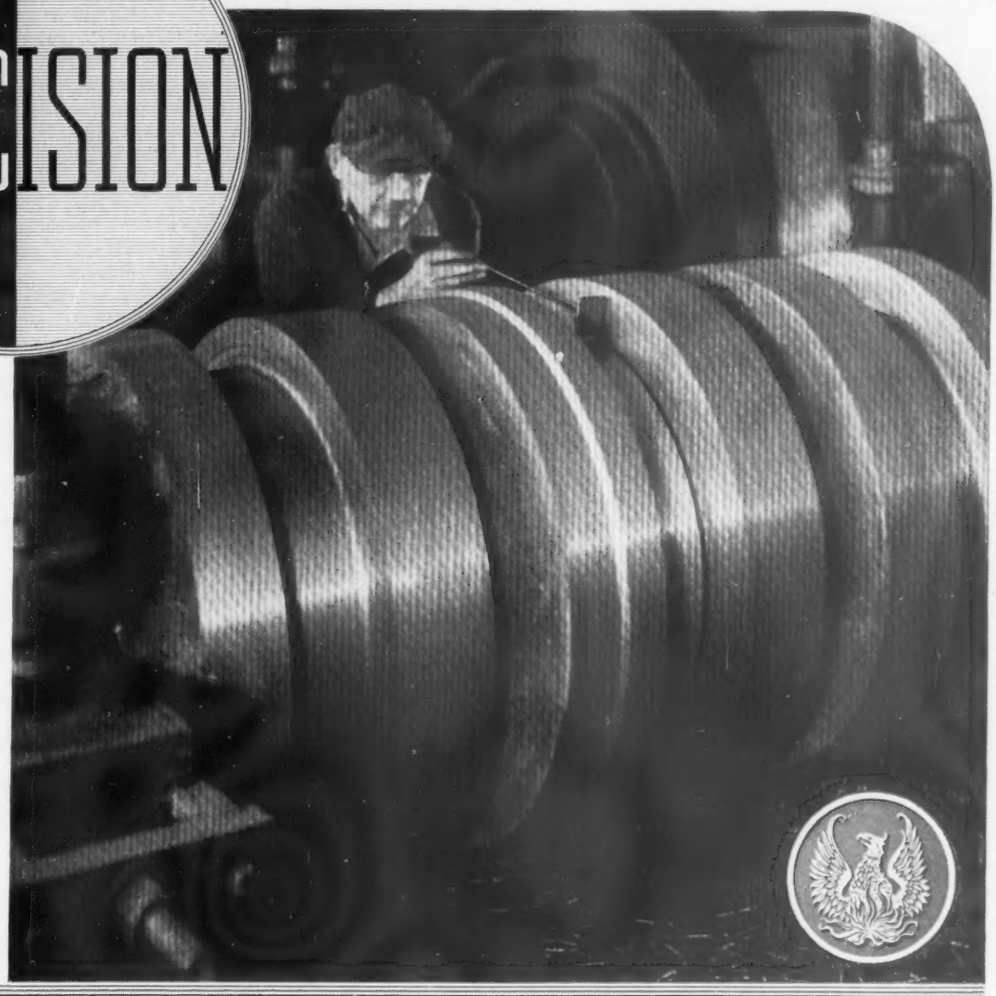

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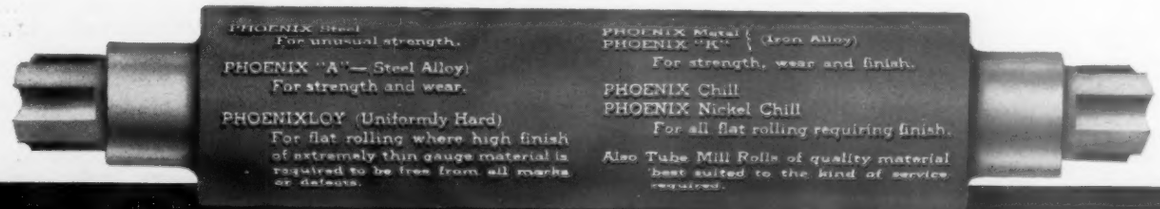
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Cites Early Background of Chromium Die Steels

To the Editor:

I am amazed at an article on page 34 of your April 16 issue headed "Die Steel Wear Resistant." It speaks about "recently" introduced types of oil-hardening die steel employing 12 per cent or more chromium and 2 per cent carbon, etc.

The writer was intimately connected already 30 years ago with the epoch-making researches by the late Mr. P. R. Kuehnrich of Sheffield in high percentage chromium steels. Already at that period steels approximately from 4 to 26 per cent chromium and up to 2.50 per cent carbon were made and tested and as the most useful commercial type of an oil-hardening, nondeforming and wear-resisting die steel, our brand "NEOR" was introduced into the markets of the world already so far back as about 30 years ago.

While there was an English patent for the early high-carbon high chromium steels, there never was one taken out in the U.S.A. and consequently the American steel manufacturers had the privilege of utilizing the extraordinary good results of such wear-resisting die steels and have made full use of their opportunities, but have always, as it appears, been ungracious enough to disregard their indebtedness to the late P. R. Kuehnrich, former chairman of Darwin & Milner Ltd., of Sheffield, England.

Therefore, to talk about this type of steel as "recently" introduced, would be belittling such work as has been done many years ago. What is more, the introduction of both cobalt and molybdenum into this type of steel as early as 1916 made such steels air-hardening. A type of steel called "cobalt-chromium" steel was patented in the United States by our firm, and is still under patent protection.

Your article also refers to the close alliance between such steels with stainless steels, and it might therefore be just as well to state that it was the fact that such high-chromium, high-carbon steels were originated by my firm's mother house in Sheffield, and were easily available, which actually led Mr. Brearley of Sheffield comparatively quickly to the discovery of the stainlessness of such steels when the carbon was reduced.

In fairness to my firm, to the writer himself, and our contributions to the development of such wear-resisting die steels, it would be only right if you would take steps to correct what seems to be an erroneous statement.

V. F. J. TLACH, President,
Darwin & Milner Inc.
Cleveland.

• • •

High Wages and Low Prices Oppress Manufacturers

To the Editor:

We see headlines about the victories of labor leaders, the down-trodden laboring man, the fleecing of the poor buying public by the conscienceless manufacturer, the heartless raising of prices, etc., and little, if anything, about the terrific struggle going on all over the country by big and little units of business to keep going and escape bankruptcy, about the tremendous sacrifices incurred before NRA and since, to spread work and pay a living wage (with some slackers, of course, which no law can prevent).

All this talk about keeping prices down would be absurd if it were not so tragic, not alone for the manufacturer but for all. Where will the employe land if the employer is ruined? In socialism or bolshevism, perhaps, where we can all stew in equal misery under the rule of a dictator who, with his satellites, will be the only winner.

Our own company, now after a year of NRA, is suffering under the lowest scale of prices for electric motors we ever experienced. We hear talk of high steel prices but does anyone expect to hear of large steel profits? Steel prices are not high; auto prices are too low for any except the mammoth makers; nearly all prices are too low except for the few who specialize and serve a big market.

Do we wish to cripple all the multitude of small employers so as to prevent the few big ones from making any profit? The big ones belong to the average man anyhow. There are but few really rich men now and surely the income and inheritance tax laws can be depended upon to strip them. Competition and the fear of it can be relied upon to keep prices down where they will be profitable only to the most efficient manufacturer.

This constant talk about high prices, without naming incidents or examples and without any proof, gives the average employe an idea that there is reason for the many demands for higher wages and so promotes unrest and leads to unwarranted strikes.

From my own experience and that of others in other lines, I think that NRA needs experts and committees and rules to prevent selling below rather than too much above cost and to realize that cost includes all the connected items of expense in addition to material and labor.

A majority of workers have a direct interest in the realizing by industry of something above cost, through ownership of life insurance policies, savings accounts or shares of stock.

F. W. JESSOP, President,
The Ohio Electric Mfg. Co.
Cleveland.

• • •

Abrasives for Blasting Steel Sheets

To the Editor:

On Page 52 of the April 16 issue, in referring to the writer's talk at Youngstown, you state:

"He emphasized that only the best grades of silica sand should be used in blasting sheets."

This statement, taken by itself, is incorrect, and I am quoting below the exact words used in my talk:

"A few words should be said about the commonly used abrasives. As far as sand goes, it might be pointed out that only the very best grades of silica sand should be used. There is no economy in using inferior grades, because they have neither the cutting qualities required nor the mechanical strength to withstand repeated impacts successfully. However, to use anything but steel abrasive today, except for special cases, would be evidence that the user is not acquainted with the present day solution of economic and hygienic blasting."

From the above you will note that I am not recommending sand for blasting steel, nor anything else, but simply stating that if sand is used, for any reason whatsoever, then the best grades of silica sand only should be used.

WM. A. ROSENBERGER, chief engineer,
Pangborn Corp.
Hagerstown, Md.